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AN ADDRESS DELIVERED BEFORE THE MASSACHUSETTS AGRICULTURAL SOCIETY AT THE BRIGHTON CATTLE SHOW, OCTOBER 13, 1818. BY J. LOWELL.

I HAVE been requested, by the Trustees of the Massachusetts Agricultural Society, to open the proceedings of this day (after suitable acknowledgments and supplications should have been made to the Author of all our blessings) by some remarks adapted to the occasion. I shall not adopt the usual course of a declamatory harangue, because it has become too common, and implies a distrust in the good sense of an audience. It seems to presuppose, that they have not judgment, patience, and taste, sufficient to relish a plain and unornamented discourse, appropriate to the peculiar objects of such an institution. In other words, one would not wish to subsist altogether on honey or even nectar. But the most powerful motive which influenced my decision was, that if a more elevated and finished style of oratory had been thought necessary, it would have been improper in one, educated at the very point of time, in which the literature of our country experienced its most extreme depression, to present himself before any audience, whose taste has been formed on higher and purer models. Believing that the simplicity and plainness of such an essay

should correspond, both with the subject and the diversity of character, which may be supposed to exist in such an audience on such an occasion, I have not declined a duty which through the partiality of the Trustees has devolved upon me. Had the present assembly been a collection of literary men alone, and designed to exhibit a specimen of our proficiency in oratory and the belles lettres, I should have been compelled to decline the task, as one utterly above my powers.

Agriculture (I beg the indulgence of the venerable fraternity of Masons) is the most *ancient* human art. It would not be extravagant to say, that it is also the most *important;* and if these two propositions are true, it deserves to be the most venerated and encouraged. Every man in the community owes to it, *directly* or indirectly, all his enjoyments, all his wealth.

However remote his occupations may seem from the pursuits of agriculture, yet on these, and these alone, he depends for his food and his emoluments. Stop the cultivation of the earth for a single season, and we should soon see of how little value are all other arts compared to this. National revenue would instantly cease, and all the vast establishments of the government, civil and military, would fall. The merchant, manufacturer, and financier, esteem themselves of the most vital importance to the state, and are apt to think too lightly of the interests, and of the silent labours of the Farmer, by which they all *exist.* They have to be sure, all of them, their subordinate and allotted share of usefulness; but in a correct and philosophical view, they are the *mere brokers of agriculture.* We would not be understood to intimate, that agriculture is not greatly indebted to the mechanick arts and to commerce, for its extension, its improvements, and its best rewards. But we would insist on the unquestionable truth, that it is the support and stay of all other arts. We think its value has never been duly appreciated, and that it has

never been admitted to its due rank, even in republican countries. In others, we know, it has always till lately been placed among the *inferior castes*; perhaps because its influence, like the sun and dews of heaven, is constant, familiar, and unobtrusive.

These are general expressions, and may be deemed by the inconsiderate, and by those who have made little reflection on the subject, extravagant. Let us then examine facts. Take Great Britain as an example, the most commercial and manufacturing nation in the world, and compare the vital importance of her agriculture with that of the other prominent and obtrusive arts. In that nation more than one half of all the families are engaged, either in commerce or manufactures. What do we find to be the relative importance of agriculture? The whole amount of the deficiency of agricultural products, in the article of bread stuffs, in the years of the greatest scarcity, does not exceed one 23d part of her consumption.

In the year 1817, which followed the most disastrous and dismal season known for a century in Europe and America, a year in which the *United States*, though pressed by the same untoward causes, furnished to Great Britain 500,000 barrels of flour, yet in that year all her imports of bread stuff only sufficed for the consumption of her population three weeks. For the remaining forty-nine, her merchants, manufacturers and her stockholders, however opulent, depended for their daily bread on the labour of her husbandmen. If the demand of Great Britain, instead of a 23d of her whole consumption, had amounted to one third, millions must have starved, and all the wealth of that nation would have been of no avail in stopping the overwhelming fury of that despair, which recognizes no law more imperious than hunger.

A single shower of rain, it has been judiciously and truly remarked, is of more actual value and profit to a nation than the gains of all its exterior commerce for a year.

Estimate our exports at 100 millions of dollars, and allow a net profit to the country of ten per cent. on every voyage, which, averaging the losses and gains, and the duration till the profit is realized, will be an ample one; for even we, with all our enterprize, and our rushing advances up the hill of prosperity, scarcely double our capital in ten years, and you derive but a meagre ten millions of dollars per annum. The loss to the whole nation, by a single year's failure in your crop of corn or hay, or the gain by one year of unusual fertility, would amount to double, or even five times this sum. Let any man take his pencil and make the most moderate calculations, and he will perceive the perfect truth and moderation of this estimate.

The goodness of Divine Providence has thus wisely ordained, that the subsistence and prosperity of the human race shall not depend on the caprices of fortune, or on the casualties and accidents to which their enterprize or cupidity may expose them, but upon causes and effects to a certain extent *always sure*, the fertility of the soil, and the general and invariable laws of nature, undisturbed by the mistaken calculations and rash adventures of man. In other words, the Almighty and Beneficent Ruler of the universe makes much more ample and certain provision of us, than the utmost stretch of human ingenuity and foresight could effect.

But grant, that agriculture is as important as you *represent*, to the prosperity, and even existence of a state, what relation or bearing has this truth, which we are all ready to admit, on *your* institution, and *your* efforts, *your* exhibition, and *your* holidays? In what manner do *they* contribute to the advancement or perfection of this art? Are they not institutions of mere show and parade, calculated to place in a prominent view the immediate actors in them, as men professing a regard to the publick good, without affording any substantial benefit to the important art which you profess to encourage?

These questions, which may be often secretly asked, though not avowed, lead us naturally to the consideration of two supposed objections, which we may fancy to be urged against the utility of such societies and such exhibitions. The first may be, that the art of agriculture is not an improveable one, by the usual and ordinary means by which other arts are advanced to perfection. That men employed in agriculture are in some degree self-taught, that there is an accumulation of knowledge derived from the experience of those who have gone before them, transmitted from father to son, and incapable of any accession from literature, science and invention. That it is an art too simple to admit of any such foreign and adventitious aids, and that the most ignorant farmer can teach the most intelligent theorists truths, which are worth abundantly more than all his theories. The second question is, that admitting agriculture to be an improveable art, in what manner do your associations, confined as they are, in their administration at least, to men who do not personally labour, who have served no apprenticeship to the art, how can they contribute to the increase and diffusion of correct agricultural knowledge?

These are the appropriate questions, which we propose to discuss at this time. We shall readily admit, that the best theoretical farmer (or, if you please, gentleman farmer) can never acquire that practical skill and adroitness, which can be learned like every other art, only by the actual personal exercise of it. I should never select a gentleman farmer to hold *my* plough, to cut *my* grass, or sow *my* seeds. There is a slight of-hand, a peculiar skill acquired in every art, which theoretical knowledge can never supply. This, however, is equally true in the mechanick employments. The art of hewing timber, or of executing a fine piece of carpentry or joiners' work, could never be acquired by reading all the ingenious and learned treatises, which have ever been written on the subject. But what carpenter or mason, engaged in the manual and practical part of

his profession *alone*, could have planned or executed those wonders of human art, the cupolas of St. Peter's and St. Paul's?

Yet Bramante, Michael Angelo and Sir Christopher Wren, the illustrious men who erected those monuments of human genius, were not practical carpenters or masons; and it is possible, that in some parts of the work they might have spoiled many valuable materials, by the inartificial and improper use of their planes or their chissels.

Apply the same reflections to the most perfect human art, that of ship building and navigation. I call it the most perfect, because the mechanism employed in the most improved modern ships, and in their management at sea, implies the greatest stretch of human ingenuity, may be considered the greatest exercise of mind over matter and the elements, exhibited in any common art. No man not bred to the sea, however great his powers, could exhibit the skill, the presence of mind, the resource in case of danger, the ingenuity which is ordinarily displayed by common seamen, regularly bred to this dangerous and enterprizing profession. Greater powers by far are called into action, than are ever exhibited in the peaceful pursuits of agriculture. And yet will you give no credit to Columbus, who united science with practical experience, and conducted the ignorant navigators of Europe, to the discovery of this vast and fair creation? Will you allow nothing to the discoverer of the magnetick powers, nothing to the inventors of the compass and quadrant? The art of navigation would have been at this day as contemptible, as it was when Æneas was twelve months making the voyage of a small part of the Mediterranean, (I do not enter into the minutiæ of criticism, as to the duration of his voyage; I take the shortest,) if men in their closets, who would have grown pale at the sight of the ocean in a storm, and who could not have saved a ship in common and ordinary dangers, had not taught the illiterate, but experienced seaman, to tra-

verse the ocean fearlessly by scientifick rules, which he does not fully comprehend, but on which experience induces him cheerfully to rely.

Examine the more common arts, those which contribute more directly to our comfort, and in which ordinary skill might be supposed to be more adequate to their perfection. The arts of spinning and weaving are almost coeval with agriculture. Yet it was reserved for an English gentleman (in humble life) in no wise connected practically with the manufacturing art (Sir Richard Arkwright) to invent a machine by which millions of the human race have been spared from manufactures to agriculture, and by which the whole produce of human industry has been almost infinitely increased. To this man's ingenuity, and to that principally or alone, do the United States owe an export in the article of cotton, to the amount of thirty millions of dollars, equal to one third of the value of all its exports. So much has the *agriculture* of the United States been indebted to science and genius, wholly independent of the untaught skill of the farmer or mechanick. If all other human arts have been so much indebted to science and genius, to men not at all concerned in their actual exercise and profits, is it to be believed, that agriculture *alone* has owed no portion of its existing improvement to the same causes? Why should this be so? Is it, that this art is so extremely simple? Are there no principles in agriculture, capable or susceptible of elucidation, extension and improvement, by the aids of human genius and science?

Is this the only art which is born perfect? Does its history justify such an extraordinary assumption and belief? An untaught man, brought up on his father's farm, proud in his independence, and thinking it patriotism to prefer every thing which belongs to his own country, without knowing what *are* the productions of other regions, may believe, that this happy country always produced wheat, and rye, and potatoes; that apples and pears and all the finer fruits are

the spontaneous productions of our own soil. Such persons should be told, that our British ancestors once subsisted on oats like our horses, and that their swine were fattened on acorns and beach nuts. That we owe to men of enterprise and of more refinement than falls to the lot of many farmers, the introduction of the more valuable grains, and *all* the fruits which contribute to our luxury and enjoyment. That the potatoe, a native of the other hemisphere, was introduced into Europe but about two centuries ago, just before the short lived settlement of our country, by men of science and research; and that invaluable as it has proved to be, it made but a slow progress, retarded by the prejudices of common farmers in Europe, who long deemed it an insalubrious, and even poisonous food. This single fact, not to be questioned, demonstrative of the benefits of enterprise, learning and perseverance, is worth a volume of powerful argument. Some of our hearers may possibly suppose that our fine cattle and horses were the native productions of our own soil, or at least of Great Britain, from whom we imported them. Such persons should be undeceived, and should be informed that our Indian predecessors knew no animal more useful than the moose, and after them, than the bear, wolf, beaver and racoon; that our barbarous ancestors in Great Britain only possessed at the time of the Norman Conquest, a miserable race of small black cattle, which we should not permit to encumber our soil; and that the horse, so necessary both in agriculture, and in every other employment, is a native of Arabia and Asia. In this connexion, permit me to notice a prejudice which I have been very sorry to see exist; and which has found its way into the publick papers, against the efforts of this society to improve the breed of domestick animals, by importations from various countries of Europe. Is this prejudice worthy of an enlightened people? Is it founded on solid and just grounds? All the stock which we have, was imported from Great Britain. Our first set-

tlers were principally poor. It is unreasonable to suppose they were at the pains, flying for their lives, as some of them did, to select the very best breeds. They probably took with them such as they possessed. But the breeds of Great Britain have been astonishingly improved since the emigration of our ancestors; while we, occupied in cultivating and subduing a wilderness, have not had the wealth or the leisure to attend to this subject, till the present golden age has dawned upon us. It should not be forgotten that the famous Chapin oxen which obtained the prizes the last year, and the still more astonishing Westbrook race, (which will be exhibited to you this day) are some of the fruits of this spirit of improvement, and of foreign importation.

It is however a pleasure, a delight, and source of gratitude to every patriotick man, that animals, however superior, do not degenerate, but improve under our climate, and upon our pastures; and the day will probably arrive, in which Europe in its turn, may eagerly seek after the improved breeds of New England.

Is it then extraordinary, that with the knowledge of these facts and this history, this society should be solicitous of trying every species of stock, as well as every agricultural implement or invention, which has obtained celebrity in Europe?

Nor is it these substantial and more important articles only, which the patriotism and intelligence of theoretical cultivators have introduced.

If we possessed the narrow list of the vegetables cultivated by the Pilgrims of New England, and should compare it with the rich and extensive catalogue of those which are now found in our gardens and fields, we should be surprised at the increase of the number, and the improvement in quality. Many varieties of the cabbage, the cauliflower, the Saba and Lima beans, the Swedish turnip, the white

beet or root of scarcity, the salsafy or oyster plant, the Lima or river Plate potatoe, the Cape of Good Hope lettuce, numerous varieties of excellent melons; and almost innumerable species of the finer fruits for the table, have been within the last half century introduced by persons, connected with such societies as the one which now solicits your attention and patronage.

Many new varieties of domestick animals have also been imported, and have contributed to the improvement of our own breeds, though having been silently scattered, and blended with our own races, their origin is forgotten; and in the pride of our hearts, we are induced to call them our own.

Shall we dare to mention the *Merino sheep*, or shall we awaken recollections of unsuccessful experiment, and individual loss, which will more than compensate the pleasure derived from this invaluable accession to our domestick flocks? But when we reflect that early efforts directed to any new object are generally unsuccessful, and the first adventurers in any new scheme are martyrs to their patriotism and zeal, (though their country ultimately reaps the benefit of them,) may we not take the liberty to plead the cause of this unoffending race of animals, and endeavour to shew, that the great efforts of this Society in encouraging their introduction, promise to be of incalculable benefit to our country? We surely are not responsible for the injudicious use which individuals may have made of so great a blessing. A man must be wholly ignorant of the history of Great Britain, who does not know, that to the products and the improvement of her sheep, she has been indebted for the largest portion of her agricultural and commercial power. Without pretending to justify that restricted policy, which has led her for more than six centuries to make the exportation of wool a capital offence, we may certainly learn from her experience, from her having made even her enemies tributary to her for the cloathing of the troops which

were arrayed against her, (for even France and the United States in the recent conflicts, did not disdain to encourage her manufactures in this manner,) we may certainly learn, that a nation, by encouraging such a staple commodity, may draw even from hostile countries the resources of her own power. The sheep of our state, (I speak from long personal observation,) are exceedingly degenerated from those of the country from which they were imported, both in point of size and fleece. To what causes this is to be attributed, we leave to others to decide, but we are not inclined to ascribe it to any fault in our climate or food, but rather to an inattention to the selection of our best animals for breeding, and to the indiscriminate condemnation of them to slaughter. Still Great Britain, with all these natural, and cultivated advantages in the breed of her sheep, and although she possesses two races or breeds peculiar to herself, the Ryeland and Southdown, which the partiality of her cultivators induces them to prefer, *even to the merino*, has been obliged to import the fleeces of the Spanish flocks, in order to enable her successfully to compete and contend with France in the production of the finer cloths. This she has uniformly done, to the amount of many millions of dollars per annum. That it is absolutely necessary for our country, if she would enjoy within herself the resources necessary to render her independent of foreign supply, to encourage a breed of fine woolled sheep, such as the merino, cannot be questioned; since we have no animals to be compared in point of fineness of fleece with the Ryeland and Southdown, and yet Great Britain, enjoying this peculiar advantage, is obliged to make immense importations of merino wool. That we ought not to be discouraged by the calamities which have fallen upon individuals engaged in this culture, who adventured in it with all the eagerness, extravagance and enthusiasm which distinguished the South Sea speculations, is apparent to every sober man. As a nation, we have made a fair experiment, and

though individuals may have suffered, the country has gained. We have proved, that they will endure our climate as well, and many excellent judges think, better, than our native flocks.

Let us state a few unquestionable facts, which should encourage us to persevere in this patriotick work. The merino sheep have succeeded for fifty years in the climate of Sweden, almost within the polar circle. In Saxony, whose temperature is at least as cold as that of New England, and where the sheep are, still more than with us, dependent on cultivated food, they have done better than in any part of the known world. The Saxons, we would hope, are not our superiours in intelligence and enterprise, though their cold and slow flowing blood may make them more patient, and less enthusiastick. Undismayed by the boldness and the dangers of transplanting an animal, a native of the finest climate of Europe, they introduced the merino into their icy region. Several years since, the number of merinoes in Saxony exceeded a million. The Saxons soon became not only the manufacturers of the finest cloths, but almost incredible to relate, they became the exporters of merino wool to the great mart of Europe, London, in which it bears a price double, sometimes even treble, that of the country from which it was originally derived. A case unparalelled, unless it be in the relative prices of Georgia Sea Island cotton, and that of Bengal, the native country of that invaluable plant. So much can human enterprise and industry effect, and such are its triumphs over climate, and we may almost say, over nature!! France, next to Saxony, has made the greatest efforts, and seems to be the most sensible to the value and importance of this animal, whose fleeces seem to be one of the richest gifts of providence to man, or at least to the inhabitants of the colder countries.

I could cite an hundred authorities from French writers, shewing the great benefits derived from the introduction of merino sheep; and it should be recollected, that their ex-

perience is not like *our own*, RECENT, but one of forty years. They never took the merino fever, but the progress with them has been gradual and constant; their experiments slow and cautious, and therefore entitled to higher confidence.

As a single example of French success in the encouragement of merino sheep, I shall cite the experiments of Mons. Morel de Vindé.

In 1805, only thirteen years since, he began an establishment with 2 rams and 92 ewes, of the merino breed. In eleven lambings, this moderate flock produced 1087 males, and 1001 females; total, 2188; of which he lost by disease, 354. He sold 534, and had remaining in good health at the end of eleven years, 1300, the produce of his original stock of 94. The money produce for that period, of this flock, was as follows. From the sales of wool, 33,381 pounds, which he sold at the moderate price of 40 cents per pound, (a price only two fifths of the average or even lowest price in Great Britain and America) he received in cash 13,600 dollars. From his sales of sheep, he realized 10,300 dollars. And his sheep on hand, valued at the rate at which the others were sold, were worth 26,000 dollars; making a total of gain in eleven years, from 94 merino sheep, of 49,000 dollars.

He estimated his remaining sheep at 20 dollars per head, which for so pure a flock cannot be deemed extravagant.

There is no fallacy in this statement, which I have been able to detect, monstrous as the result may appear to be, that from a capital of 1800 dollars in sheep, a produce of 50,000 dollars had been realized in eleven years.

The question, then, is as to the author's veracity. We have only to remark, that taking into consideration his high standing in society, and that of the work in which his account appeared, Mons. Tessier's annals of French agriculture, the most respectable in that nation; taking also into

the account, that his statements were fully believed in that sagacious and disputing country, we think as much credit is due to it, as to the statements published by this Society of the size of the Chapin oxen, or the unexampled rapidity and skill with which our ploughing matches were performed the last year. Yet who would doubt the correctness of the accounts of this Society, watched as we are by a thousand vigilant eyes?

M. Morel de Vindé, the author of the above successful and patient experiment, furnishes another argument in favour of merino sheep, which we, and we doubt not that you, will esteem of vastly higher importance. He remarks, that wherever merino sheep have been introduced in France, the whole course of the agriculture of the country has instantly improved. He does not repose this assertion upon the credit of his own reputation and opinion, but gives the following natural and rational solution of it. With respect to other sheep, he remarks, the farmer calculates chiefly on the profits derived from their *death*. But as to the merino, he relies principally on their preservation and *lives*. In other words, ordinary sheep are principally raised for the *butcher;* these for the *manufacturer*. The one for their *carcases;* the other for their *fleeces*.

With these utterly discordant views, it becomes necessary for the raiser of *merino* sheep, to keep them longer, to preserve them carefully, and to increase their number; but as this would be impracticable, in the common, old fashioned, careless mode of cultivation, as the ordinary produce of neglected farms will not suffice to keep over so large a number of sheep, farmers who would raise this species of sheep are compelled to adopt a better system, to break up more land, to try new plants and vegetables, to convert their farms into extensive gardens, in order to furnish food for these very profitable animals in the winter season. Thus he remarks in every district of France,

where they have been introduced, agriculture has instantly and sensibly improved. We are aware that in the vicinity of our great towns, where the farmer already enjoys as much encouragement as he can wish, by a ready demand for his productions, these arguments do not apply. But if the introduction of these sheep into the interior will tend, as it has done in Saxony and France, to induce our farmers to raise large quantities of carrots, turnips and potatoes, and to increase the amount of their crops of hay, it will surely be productive of great improvement in our cultivation. We cannot believe that the illiterate and bigotted peasants of France can surpass our farmers in enterprise and industry.

Let us then not despair of the ultimate success of the breed of merino sheep. They may, (as they *have* done) often change owners, till they get into the hands of the intelligent, economical and industrious. The first adventurers may suffer loss, but the country will be ultimately enriched. Already merino wool has been within our knowledge exported to Great Britain without loss, and it would not be more extraordinary than many things which this age of enterprise has witnessed, to see it become one of the staple exports of New England. Entirely disconnected personally with this speculation, I hold in high honour those few independent men, who, not yielding to a rash and unfounded despair, have continued to encourage this unpopular race of animals, with a conviction that their country would be ultimately benefitted, and that a temporary depression would be followed by a just and reasonable estimation of their value.

I have thus endeavoured to shew *very briefly*, if we consider the *extent of the subject*, but very *tediously*, in reference to the *patience* of an audience; (for what writer has the art of knowing to what extent he may safely stretch *that* patience, and at what precise point, disgust and fatigue will commence?) I have endeavoured to shew that

agriculture, like all other arts, is indebted to the enterprise and efforts of men not immediately concerned in it as a source of subsistence, for many of its most important improvements. It would indeed *not* weaken the argument to admit, that many of the experiments of theoretical farmers entirely fail. How long did the alchymists waste their learning and labour, in endeavouring to produce gold where *none was to be found*, and yet to them we owe the present improvements in chemistry, which more than any other science has contributed to the present improved state of the arts. There were more than twenty unsuccessful attempts to apply the well known power of steam to the propelling of vessels, before our Fulton had the glory and good fortune to bring to perfection one of the most important discoveries in the arts.

I have purposely omitted in the enumeration of the benefits which agricu ture has derived from science, those to which chemistry has given birth. The subject is too abstract for a mixed audience. But there are few persons who have read the late able and interesting work of Sir Humphrey Davy on Agricultural Chemistry, who do not perceive its intimate connexion with this important art, or who do not feel a prophetic conviction of its future usefulness. This however is a subject with which the practical farmer cannot trouble himself. He would only be confused and bewildered should he attempt it; but there is reasonable ground of hope, that men of leisure and science, (and such the rapid prosperity of our country is constantly producing) will be led to more accurate and philosophical views of agriculture, and that from their experiments, their neighbours will derive great ultimate advantage.

This is the order of nature. When Newton was investigating the laws of the planetary system, the untutored sailor little dreamed, that his efforts were to afford him a safer and more rapid progress over the mountain waves.

We now proceed to the discussion of the second question. Admitting that the efforts of men of leisure and science are promotive of the interests of agriculture, in what manner do your societies, your premiums and your shews, contribute to this end? The first reply we make, is by presenting the example, consent and united opinion of the governments and people of the most enlightened countries. We have no better foundation for our opinions on questions of taste, political economy or morals. The general sentiment of enlightened men in an age of free inquiry, forms as solid a foundation for our conduct as any which we can devise. The first publick society of this description, we believe, was found in Great Britain; whose agriculture, even at the time of its foundation, was in a more improved state, than that of any other European nation, except, perhaps, Flanders. The Bath and West of England Society had the honour of leading the van in this generous attempt to improve and elevate the most important and interesting, as well as most innocent human art. That art which, free from vice, or a tendency to produce it, is productive of none of the injurious effects, from which not many other extensive human arts are wholly exempt. The British nation soon became awakened to the importance and value of such institutions, and by a parliamentary provision, with noble munificence, founded a National Society. The state of Massachusetts had the glory of early appreciating the value of such institutions, and this Society can trace its origin to a period, when those of Europe were still in their infancy. It is this noble emulation in virtue, in efforts to increase the prosperity and happiness of the human race, by increasing and multiplying their comforts, which redounds much more to the honour of human nature, than all the splendid atchievements which fill up the black page of history; a page which is little else than the record of human weaknesses, passions and crimes. France, the

jealous rival of Great Britain, but her generous competitor in the arts, soon followed her example, and of her hundred departments, there is scarcely one which does not boast a Society for the promotion of agriculture. Happy would it be for the world, if these two *great gladiators*, whose swords have scarcely been sheathed for a thousand years, who have estimated their glory only by the extent of their butcheries of the human race, would hereafter rival each other only in the arts of peace.

The example of the enlightened nations of Europe has not been lost on the United States, and Agricultural Societies are spreading with a rapidity in our country, which affords the best hopes, that this art will not only hereafter be held in higher honour, and cultivated with the zeal and intelligence which it merits, but that it will supplant those ambitious and dangerous propensities, alike fatal to our repose and our morals. But though this common consent of the enlightened world might be deemed of itself a sufficient proof of the value of such societies, we may not fear to appeal to higher evidence, the principles of the human heart, and the operations of human passions.

Is this the only profession in which men are insensible to public favour, estimation and rewards? It has been till of late years treated by rulers, as if it was an ignoble and degrading employment, and so it was so long as it was exercised only by cerfs and slaves. In France, within fifty years, the employment of a farmer was considered a degrading one. But if it is thought to nerve the soldier's, or sailor's arm, or to invigorate their courage, and to induce them to be more prodigal of their own blood, and that of their enemies, to be profuse in our applause and our rewards, our votes of thanks and swords, and triumphs; do you think that the retired and modest cultivator of the earth will feel no pride in seeing his country honour and reward his silent, peaceful, but invaluable labours?

Must we *always* act in direct contradiction to our principles *and best interests*, and place a value on qualities and attainments which are destructive of our welfare, to the utter neglect of those upon which the existence and prosperity of our country depend?

Men, and their feelings and motives, are the same, in whatever situation they may be placed. They may be taught to encourage the ferocious passions or to cultivate the kindly affections. It depends on rulers and on the laws, to give them a virtuous and useful, or vicious and pernicious direction. The plain and too much forgotten and neglected husbandman, contributes *directly* or *indirectly* more than seven-eighths of all that is effected towards the support and prosperity of a state. Indeed their number in our happy country is nearly in that ratio. It cannot be questioned, unless the laws of nature are reversed as to this great mass of society, our chief stay and support, that attentions to their profession, the holding it in deserved respect, the rewarding examples of successful and peculiar industry in individuals, must have an influence on the advancement and progress of the art. The spirit of emulation is as capable of being excited in this art, as in the calamitous, and what we all acknowledge to be the unprofitable one of war. A farmer's breast is as open to generous feelings, is as alive to applause and approbation, and as much chilled by neglect, as that of the proudest spirit which ever wore a sword. Our defence then of these exhibitions and these rewards, rests on the immutable laws which regulate the human heart. If further argument could be necessary, it would be found in the generous and enlightened spirit of the men (most of whom are gone to receive the rewards of virtuous and well spent lives, in a better and happier world) who were the munificent founders of this society in a poorer age, and by whose generous donations we are chiefly enabled to reward the efforts of our industrious and enterprizing citizens, and in the continued

marks of individual approbation, recently exhibited in the contributions towards the erection of an edifice, calculated to give accommodation and respectability to this institution. We may be permitted to express a hope, that this patronage is not exhausted, but that we may derive from the public spirit of those who have not yet had the honor to enrol themselves among our benefactors, the means of completing the edifice, which the liberality of others has enabled us to erect.

In a republican government, the best evidence of the utility of any system, or project, must however be drawn from the approbation of the Legislature; and we are happy in having this opportunity of expressing our gratitude to the Commonwealth for its long continued, deliberate, and zealous support and encouragement.

The countenance afforded in past years, and on the present occasion, by the first magistrate of the state, and the other publick functionaries, whom the people have delighted to honour, is not the smallest proof of the high estimation in which agriculture, and all the efforts to promote its extension, are held in this enlightened Commonwealth. Let us then, my friends, upon this occasion and on this subject, upon which there can be no division of sentiment, no unkind and uncharitable feelings, which too often embitter our discussions on other topics, proceed to the innocent and delightful duties of this day, with a cordiality of feeling, which may make some reparation for the pain and distress, which our unhappy divisions on other occasions, and in past times, have too often produced. Let such scenes, often repeated, soften our asperities, and make us feel, that we are truly the children of a common country and a common Parent; and let us now unitedly render our unfeigned thanks to that benevolent Being, to whom we are indebted for all the blessings, which this occasion is designed more particularly to display.

TRUSTEES' ACCOUNT OF THE CATTLE SHOW, AND EXHIBITION OF MANUFACTURES, AT BRIGHTON.

On Tuesday, the 13th day of October, the Cattle Show commenced at *Brighton*, pursuant to the notice issued by the Trustees of the *Massachusetts Agricultural Society*. The weather on that morning was very unpromising, which prevented many of the citizens of the town, who are afraid of exposing their health, from attending. From all parts of the state, and especially from the neighbouring counties, the attendance was greater than ever before known. The proceedings were opened by prayer by the Rev. Dr. Foster, and the rules, regulations and arrangements, were announced by the President. After which the Committees, for awarding premiums on Live Stock and of Domestic and Household Manufactures, proceeded to the examination of the various and numerous articles presented for premium.

The exhibition of animals offered for premium this year far exceeded that of any former year, both in number and quality. If there was any exception, it was in the article of Milch Cows. Several very fine ones were certainly to be seen, but we indulge the hope of seeing this essential class of animals of a still more improved grade, the *most important*, as the foundation of two of our staple productions, Butter and Cheese, and the *necessary* instruments in the improvement of our breed of cattle.

The first article taken into consideration among the live stock, was the native *Bulls*. There were many fine specimens of this animal—principally, however, almost too young to enable the judges to form a correct opinion of their *future value*. Among those which did not receive a premium, but which were highly deserving of public notice, were those of Mr. Gregory Mason, of Shrewsbury;—the beautiful calf of Nathaniel Chandler, Esq. of Petersham, of a race highly valued, but nearly extinct in the county of Worcester. We have understood with plea-

sure that this six months' calf was sold for sixty dollars, and we hope that the purchaser will cherish and preserve this valuable breed. A fine *Bull* was also exhibited by Asahel Pomeroy, Esq. of Northampton; another by Mr. Eli Forrester; and an excellent but more aged *Bull*, by Mr. Gordon, the owner of the famous Westbrook cattle. We trust the owners of these animals, and all other persons in every class of exhibition, who did not obtain premiums, will recollect that it was impossible that all should obtain rewards; that they have done great credit to themselves and their native state, by contributing to the respectability of the *Show*, and that their turn for premiums may come another year. We indulge the hope, that a higher and nobler wish than that of being the successful competitors had an influence in inducing them to honour the Society and benefit the State, by exhibiting the noble specimens of their care and skill. We return them our thanks. Let them all be persuaded, that we manage our exhibitions, and decide our premiums, with all the impartiality in our power. In the present year, to prevent the possibility of the imputation of prejudice, the trustees only placed a Chairman on each Committee. In all cases a majority of the judges, and in the most important one, that of Live Stock, which was the first object of the Institution, there were four persons out of five selected from the citizens at large.

The Committee on Live Stock were Messrs. J. Lowell, Isaac M'Lellan, Joseph Harrington, Ebenezer Gay, and Abijah White.

The *first* premium for the best native *Bull* was awarded to Gorham Parsons, Esq. of Brighton, 40 dollars.

The *second* do. to Tilly Higgins, of South Berwick, 25 dollars.

The *first* premium for the best *Milch Cow*, to Ebenezer Pope, of Sterling, 40 dollars.

The *second* do. to the great Westbrook Cow, owned by Mr. Gordon, of Westbrook, the parent of the great race of animals exhibited by him, 30 dollars.

The *third* do. for Milch Cows, to S. W. Pomeroy, Esq. of Brighton, 20 dollars.

There were some excellent Cows which attracted the attention of the judges, and merited it, owned by Gen. Gardner, of Brooklyne, Ebenezer Thayer, Esq. of Boston, Messrs. Dudley Hardy, of Brighton, and Luke Fisk, of Waltham.

We cannot introduce the next subject of premium, *Fat Oxen*, without remarking that this exhibition would have been deemed extraordinary at *Smithfield*, *Lowes* and *Holkham*, in Great Britain. It is almost beyond belief, that a single year should have furnished in *one* state, when there were two other rival Shows in other parts of it, the same week, oxen actually, and accurately weighed *alive*, of the following weights:—

Great Chapin Ox, now offered for premium, -	2784
Benjamin Warren's Ox - - - - -	2475
Luke Fisk's, of Waltham, - - - -	2449
Rufus Marble's, of Sutton, 1st premium, - -	2389
Luke Fisk's 2d premium, - - - -	2297
Edward Whitman's, of Stow, 3d do. - -	2295
Jonas White and Son's, - - - - -	2047
do. do. - - - - -	1986
John Perley's, District of Maine, - - -	1825

The premiums were not awarded according to weight only, as will be perceived. The Trustees do not mean to have it understood that *weight* alone shall be considered, but form, fatness, and a disposition to fatten *easily*. Mr. Warren would have had the second premium, but his ox was raised *out* of the state, though *fattened in it*. We beg the attention of the farmers to this distinction. It is not an illiberal one. It is as much as *Massachusetts* can do to encourage her own Agriculture, and she is *bound* to give it the *preference*. Messrs. White's oxen, though smaller, were so well formed, and so well fatted, that they would have had a premium, if Mr. Abijah White, being

one of the judges, had not declined to have them considered.

The first premium for a fat *Ox* was awarded to Mr. Rufus Marble, of Sutton, 50 dollars.

The 2d do. do. to Mr. Luke Fisk, of Waltham, 40 dollars.

The 3d do. do. to Mr. Edward Whitman, of Stow, 30 dollars.

The 1st premium for *Working Cattle* to the Hon. John Welles, of Dorchester, 40 dollars.

The 2d do. to Mr. Asa Rice, 30 dollars.

The 3d do. to Mr. Aaron D. Williams, of Roxbury, 20 dollars.

For the best *Merino Ewes*, six in number, to Gorham Parsons, Esq. of Brighton, 30 dollars.

For the next best do. to John Parkman, Esq. of Brighton, 10 dollars.

For the best *Native Wethers*, to Mr. Andrew Smith, of Rutland, 10 dollars.

For the next best do. to the same person, 5 dollars.

We should be extremely pleased to see more competition in our owners of *Native Sheep*. They *need* improvement, and coarse wool is more essential than fine, important as the former may be.

For the best *Merino Ram*, to Richard Crowninshield, Esq. of Danvers, 20 dollars.

For the next best do. to Mr. Moses Coleman, Byfield, 10 dollars.

Mr. Parkman's ram was also adjudged a fine animal, though his fleece was not thought quite equal to the two to which the premiums were awarded.

For the best *Boar*, to Charles Vaughan, Esq. of Hallowell, Kennebec county, 15 dollars.

For the next best do. to Mr. Luke Fisk, of Waltham, 5 dollars.

The Hon. Mr. Pickering, of Danvers, exhibited a very fine boar, of the Bedford and native race, and a barrow of the same breed. Mr. Joseph Brown also presented for premium, a boar of very good form.

For the best *Sows*, two in number, to Mr. J. L. Knapp, of Brighton, 10 dollars.

For the best *Pigs*, to Mr. Lincoln Brigham, Cambridge, 10 dollars.

For the next best do. to William Hull, Esq. of Newton, 5 dollars.

For the best imported *Bull* of the Teeswater breed, a noble animal, to Stephen Williams, Esq. of Northborough, 100 dollars.

For the next best do. imported by Colonel Thorndike, well known by the name of *Fill Pail*, to Mr. Aaron Richards, the present possessor, 75 dollars.

The Teeswater bull was imported last fall, from Great Britain, and is a most important addition to our stock.

Fill Pail was presented by Col. Thorndike to the Society. He is of the Flanders' breed, and particularly calculated for raising cattle for the dairy.

The greater amount of premiums on foreign Stock was granted, in consideration of the heavy expense of importation.

Brighton, Oct. 14, 1818.

The Committee on Domestic Manufactures, having examined the various articles submitted to them, respectfully report the following award of premiums:—

To Messrs. Shepherd and Jones, of Northampton, for the best specimens of fine Broadcloth, the first premium of - - - - $30

To the Rock Bottom Company, of Marlborough, the second premium for do. - - - 20

To Mr. Payson Williams, of Fitzburg, the first premium for Woollen Cloth of household manufacture, - - - - - - $12

To Mr. John Hayes, of Saco, the second premium for do. - - - - - - 8

Three pieces of Drab Cloth, exhibited by Messrs. Shepherd and Jones, were thought to be as fine and well finished as the best imported cloths of the same description; and all their specimens, consisting of nine pieces, were wholly free, it was observed, from the smell of dye stuffs and oil, which is sometimes perceived in our woollen fabrics.

In deciding the relative merit of the different articles, the Committee did not lose sight of what ought to be the positive merit to entitle any to premiums, in the present advanced state of some branches of manufacture. The Committee, however, are warranted by the exhibition the present year in saying, that the character of our woollen fabrics is now too well established for any ground of fear, that the best which shall be exhibited in any future year will be too poor to deserve a premium. Several of the specimens offered by the unsuccessful candidates were, in the judgment of the Committee, good cloths; and the prices affixed to them so moderate, as to indicate a strong probability of a prevailing competition with those of foreign importation, at no very distant period.

The Committee further report an award of premiums to the following persons:—

To Messrs. Wolcott and Groves, of Southbridge, for a specimen of Cassimere, - - - $10

To Mr. Payson Williams, of Fitzburg, for a specimen of Flannel of household manufacture, the premium of - - - - - 10

To Mr. Nahum Hardy, of Waltham, for Butter of an extraordinary quality, - - - 10

To Mrs. Elizabeth Childs, of Cambridge, for fine specimens of sewing silk of various colours,

and for articles of silk manufacture from silk-worms raised by herself, the premium of - $5

In this last case it was stated to the Committee, that the expense of providing and preparing the raw material and manufacturing a pound of sewing silk, did not exceed that of a pound of common brown thread.

Several articles were exhibited for which no specific premiums had been offered. But as they evince a laudable spirit of enterprise and industry and are useful fabrics and of household manufacture, the Committee take the liberty to exercise a discretion in recommending the following premiums, viz. :—

To Miss Bourne, of Kennebunk, for a Cotton Counterpane, - - - - - $8
To Miss Olive Temple, of West Boylston, for do. 8
To Mrs. Judith Sargent for a pair of fine Woollen Hose, - - - - - - 5
To Miss Mary H. Leach, of Salem, for a specimen of silk Buttons, - - - - - 5
To Miss Susannah Bass, of Quincy, for a Carpet, 5
To Miss Lyman for a specimen of Gloves, - 3
To Mr. Lewis Nason, for extra fine Straw Bonnets, 10
To Mr. John Kennedy, of Seconk, for Damask Table Cloths, - - - - - 5
To Mr. James Watson, of Attleborough, for specimens of Bedticking, - - - - 10
To Mrs. Richard Crowninshield, of Danvers, for several specimens of Linen Thread, - - 5

A Lace Veil was shewn, from the factory of Mr. Francis White and Charles Davis, Esq. at Watertown. The establishment of Messrs. White and Davis is recent, and promises from the fineness and beauty of the specimen exhibited, to deserve the future countenance of this Society.

Several extra fine Beaver Hats were exhibited, by Mr. Guerin from his manufactory at South Boston.

The Trustees must have noticed with pleasure the specimens of elegant cut Flint Glass, exhibited by the New England Glass Company at the Society's Hall. It was stated, that the exports of this article had already been large for the time the works have been in operation. And thus while they administer to the luxury of persons beyond the limits of the state, they afford a profitable employment of capital, and give support to an ingenious and industrious class of labourers, who, being foreigners, add the profits of their ingenuity and skill to the common stock of wealth in this community. Fifty persons are now employed in the various branches of this business, and the capital vested is forty thousand dollars.

The growing prosperity of the several branches of manufactures which may be considered as established, particularly that of cotton, now placed on a secure foundation by the admirable machinery invented and perfected by the Boston Manufacturing Company at Waltham, and the increasing subdivision of labour observable in mechanic employments in all parts of the community, will authorize us to consider our country as now enjoying many of those advantages pointed out by a great practical statesman, as annexed to a flourishing state of domestic manufactures. Among which may be enumerated

The additional employment afforded to classes of the the community, who have leisure from their other and ordinary occupations.

The furnishing greater scope for the diversity of talents and dispositions existing among men.

The affording a more ample and various field for enterprise.

The creating in some instances a new, and securing in all, a more certain and steady demand for the surplus produce of the soil.

An extension of the use of machinery ; and lastly,

The employment of persons who would otherwise be idle, either from the bias of temper, infirmity of body, or some other cause, indisposing or disqualifying them for the toils of husbandry.

RICHARD SULLIVAN,
WILLIAM LAWRENCE. } *Committee.*

The Committee consisting of Gorham Parsons, of Brighton, Jonas White, of Watertown, Esquires, and Mr. Isaac Davis, of Roxbury, to whom was referred the Ploughing Match, have attended that business, and ask leave to report, That in consequence of bad weather, the 14th, the work was postponed to this day, the 15th. When they repaired to a piece of ground belonging to Mr. Parsons, which had been previously surveyed into twelve lots of one quarter of an acre each. But on examining the book of entries produced by Mr. Winship, it was found, that only seven of the nine competitors had appeared on the ground, and subscribed the rules and regulations as directed by the Trustees. The seven competitors drew for a choice of lots, when it was found,

That No. 1 was drawn by Samuel Ward, of Roxbury; his team one yoke of oxen, his ploughman Samuel Clarke, and no driver. Work performed in 47 minutes, 33 seconds. Plough made by Jesse Warren of Dedham.

No. 2 by Timothy Cosey, of Brooklyne; his team two yoke of oxen, ploughman Timothy Cosey, driver Alfred Snell. Work performed in 35 seconds, 45 seconds. Plough made by Bigelow of Weston.

No. 3 by Samuel Ward, of Roxbury; his team two yoke of oxen, ploughman Ezekiel Colburn, driver Nathaniel Ham. Work performed in 41 minutes, 30 seconds. Plough made by Jesse Warren in Dedham.

No. 4 by Ebenezer Stedman, of Cambridge; his team one yoke of oxen, driver Samuel Stedman. Work per-

formed in 62 minutes, with the aid of an additional yoke of oxen the last 10 minutes. Plough made by Washburn and Bramin.

No. 5 by Joseph Curtis, of Roxbury; his team two yoke of oxen, Thomas Blake ploughman, driver George Boyden. Work performed in 40 minutes, 30 seconds. Plough made by Jesse Warren of Dedham.

No. 6 by John Prince, Esq. of Roxbury; his team two yoke of oxen, ploughman Thomas James, driver ———. Work performed in 34 minutes, 50 seconds.

No. 7 by Aaron Davis Williams; two yoke of oxen, ploughman Thomas Howe, driver Daniel Howe. Work performed in 39 minutes, 30 seconds. Plough made by Jesse Warren of Dedham.

Your Committee regret they had not a premium to award every competitor, for *all* ploughed well, and deserve some mark of public approbation; but being under the necessity of selecting those which, in their opinion, have the strongest claim to the premiums offered by the Trustees, in their decision they ask your confidence, they request your approbation, for they have endeavoured to deserve it, and award as follows:—

To Capt. Joseph Curtis, first premium, plough,	$ 20	
Thomas Blake, ploughman, - - -	10	
George Boyden, driver, - - -	5	
		—— $ 35
To Samuel Ward, second premium, plough,	$12	
Samuel Clark, ploughman, - - -	6	
Samuel Clark, who had no driver, - -	3	
		—— $ 21

Your Committee beg leave to observe, that in giving Mr. Ward the second premium, they would not have it understood they approve the mode of turning sward land with one yoke of cattle, and without a driver; they consider it injudicious, and not the mode in which the best farmers do their work, when they wish most to economise; and the

farmer who practices it cannot be considered as merciful to his beasts. But it is awarded on the principle on which the premium was given out, and the decision approbated the last season in a like case.

For the third premium they found three competitors who had very strong claims to it, Mr. A. D. Williams, Mr. Timothy Cosey, and John Prince, Esq. They were much at a loss how to decide; they despair of satisfying the public, for they could not satisfy themselves; but compelled to award the premium, they have with great difficulty on their minds awarded to Aaron Davis Williams, of Roxbury.

Plough, - - - - -	$12
Thomas Howe, ploughman, - -	4
David Howe, driver, - - -	2
	——$18

All which is respectfully submitted,

GORHAM PARSONS, *Per Order.*

Report of the Committee on Agricultural Experiments, made to the Trustees, at their stated meeting on Saturday, Dec. 26, 1818.

The Committee decide that Capt. David Little of Newbury, in the county of Essex, is entitled to the premium of thirty dollars, for having raised the greatest quantity of carrots on one acre of ground; and that Mr. Payson Williams of Fitchburg, in the county of Worcester, is entitled to the premium of thirty dollars, for the greatest crop of potatoes.

For the premium on carrots there were three competitors, all of whom had very large crops. Mr. Little, Mr. John Pierce of Dorchester, in Norfolk county, and Mr. John Parkman of Brighton, in Middlesex. Supposing each bushel to weigh 56 pounds, Mr. Little had 878 bushels, Mr. Pierce 820, and Mr. Parkman 650; yielding on an average more than 19 tons to an acre. The modes of cul-

ture were much the same in the three cases, excepting that Mr. Little made use of a drill in sowing which lessened the expense greatly; and he used more manure, by a third part, than the others. Putting all the charges together, Mr. Little expended a less sum than either of the other two, yet his crop was the largest by nearly three tons. His account of the manner and expense of cultivation, stated by himself so plainly as to be easily understood by by every farmer, will be annexed to this report.

For the premium on potatoes, Mr. Williams had no competitor. Had his crop therefore been a poor one, he must have had the premium. It was 498 bushels, which may be considered a good crop.

It will be seen by Mr. Williams's account, which is annexed, that one part of his acre was planted in trenches, and the other in hills, and that the result was rather in favour of hill-planting, which is the more common method. Having used *new* manure on one part, and *old* on another, he found the crop much better where the *new* was placed. This also is in conformity with the prevailing opinion. But although the experiments of Mr. Williams, as to trench planting and old manure, seem to prove the usual way of raising potatoes to be the best (and if so, it ought to be continued) yet all such trials have their uses; and we ought to feel obliged to any one who will be at the pains to make them.

The Committee regret, that there were no more claimants under the head of Agricultural Experiments. One reason may have been, that for many articles the season was unfavourable. Owing to a cold and very wet spring, and to its having been very dry from the latter part of July, the crops of wheat and other grains were uncommonly light. From about the 24th of July to the 7th of September, forty-five days, there was little or no rain, at least in this vicinity; and the consequence was, that potatoes and turnips fell far below the usual quantity. Carrots

yielded very plentifully, notwithstanding the want of rain; and it may not be amiss to notice this as proof of its being a more certain crop than some other vegetables. But though the exhibitions made to the Committee this year, from whatever causes, have been few, the Committee are gratified in being able to state, that it is becoming a common thing among provident farmers to attend to the raising of roots, in considerable quantities, as winter food for cattle. Several instances have come within their knowledge, this season, in all of which the amount of the produce has been very encouraging, though generally on pieces of less than an acre. When it is considered that an acre of carrots, potatoes or turnips, will, in a common season and with no uncommon care, yield five or six times the weight of food for cattle, that an acre of grass land will produce, and of food as nutritious as hay, and of which cattle are quite as fond, this alone would seem a sufficient inducement to our farmers to go into this kind of culture on a larger scale. In England the importance of cultivating roots, as food for animals, is so well understood, that though grass must be a principal object always with farmers, yet few or none omit to raise large quantities of vegetables. A man would hardly be called a good farmer, who did not provide for his cattle in this way. It should be considered too, how much better our stock would be, and of course, how much more useful and profitable, by feeding them on a variety of food, instead of being confined during our long winters of six months, to dry hay. Those who have followed this method in feeding their milch cows, oxen, horses and sheep, need nothing said to convince them of the truth of this remark; as a further inducement it may be observed, that our crops of hay often fall short—so much so, sometimes, as to force the owners of cattle to sell them at a loss, or kill them, for want of food. The same season which may prove unfavourable for grass crops, may not, and very probably will not, be so for carrots and many other vegetables; and

what an excellent resort would they afford in such cases? The Committee may be allowed to dwell a little on this subject, as it has become a common opinion, that even our best agriculturalists have erred greatly in this respect, and that it would be a prodigious improvement in our husbandry, if it was made a rule to raise every year a large quantity of roots for the express purpose of feeding cattle, instead of confining them so exclusively to hay as is now the practice.

No claim was made this year for the premium on wheat. Some persons, perhaps, who had good crops of this article, were prevented from becoming candidates from a belief, that others might have had better. After the premiums were paid out and published last year, some of the Trustees were told, that in the District of Maine, there were many crops of wheat which far exceeded the one in Shrewsbury, of thirty-five bushels to the acre, on which the premium was given. It would have been, and still will be, gratifying to the Trustees to award some of the premiums to farmers of that interesting and valuable section of the state; and it is hoped, that another year will bring forward candidates from that quarter. In the articles of wheat and potatoes, at least, they need not fear to come in competition with any part of the Commonwealth.

With respect to some of the objects to which the public attention is called, under the head of agricultural experiments, it must not be expected, that our practical farmers, generally, will contend for them at present. What has been almost wholly untried or requires uncommon care, should first be attempted and proved profitable and well suited to the climate, or otherwise, by the few who can best afford, and ought not to regard, the necessary time and expense. It is in this way, that valuable improvements have been introduced into other countries; and it ought to be so in ours, which affords a field so ample. All classes of agriculturalists, theoretical and practical, as they

regard a most important interest, are called upon to afford all the aid in their power towards meliorating the agriculture of our country. Much remains to be done. Vain will it be to have societies for the promotion of such objects, unless ingenious, enterprising, and industrious individuals, throughout the state, will join their efforts and communicate the result of their exertions. It is no mean pursuit. "The true objects of the agriculturalist are likewise those of the patriot. Men value most what they have gained with effort; a just confidence in their own powers results from success; they love their country better, because they have seen it improved by their own talents and industry; and they identify with their interests, the existence of those institutions which have afforded them security, indedence, and the multiplied enjoyments of civilized life."*

P. C. BROOKS, *Chairman.*

Newbury, Nov. 28th, 1818.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

Agreeably to your directions, I hereby undertake to state to you the quality of the land, on which I raised carrots the present year, and on account of which, I have in due season put in my claim for the premium, having obtained a certificate for its entry, &c. About one third of the land is situate on a gentle swell, and is a pretty deep yellowish loam; the other two-thirds falls off southwesterly, and is level, or rather flat land, and is a deep black loam, and not very stiff. The quantity of manure and amount of produce I cannot accurately state, but believe there were about from fifteen to twenty common cart loads of yard manure put on the land, and ploughed in, cultivated principally as a garden, with onions, carrots, beets, and potatoes, in the year 1817. The quantity of manure the present year was seventeen common cart loads, ploughed in;

* Sir H. Davy.

the quantity of seed used for the carrots the present year, was one pound; but half that quantity would have been sufficient. The time of sowing my carrots was the 9th day of May; the manner of sowing was as follows:—After the ground was prepared, I marked out the rows fourteen inches wide with a marking rake, and rooled a machine (made for the purpose) with two wheels and two hoppers in two of the rows at once, dropping the seed at suitable distance as it passed. I commenced weeding the 2d day of June, hoeing betweeu the rows with a common hoe, and plucking weeds with fingers between the carrots. About one third part of the work was performed by children through the season, and I worked when it was most convenient; and after weeding them three times over, and calculating the time really spent, I found it equal to twenty-four or five days work for one man. The harvesting was commenced the 26th of October and ended the 12th of November; the mannner of harvesting was by running a plough near the row, and the carrots were thrown out with a clam digger; the whole time spent in harvesting was about fifteen days for one man. The whole amount of produce was nine hundred and sixty one bushels of carrots, and where the seed did not come up, or was destroyed by insects, about two bushels of beets were raised, and fifty-one cabbage heads, together with a great number of cabbage plants which were sown with the carrot seed, and yet I think there was as much as four or five rods of land remaining, where nothing grew for want of seed; and after all there were fifty apple and pear trees set in the spring of 1817, two other apple trees whose branches extended one rod and an half, four others, whose branches extended about ten feet each, the damage of the above trees, together with a row of apple trees standing near, and on the south side of my carrot bed, in my estimation was equal to fifty bushels of carrots at least.

DAVID LITTLE, *Owner.*
STEPHEN LITTLE, *Assistant.*

N. B. Our common carts hold about forty bushels; the black loam land was most productive.

1818. EXPENSE.

Seventeen loads of manure, equal to - -	$ 29	50
April 25th and May 2d, two ploughings, -	6	
Three harrowings, - - - -	1	
Two men half a day raking the ground, -	1	
One day markind rows and raking in seed -	1	
One pound of seed, - - - -	1	
Four hours sowing seed, - - -		50
June 2d to September, weeding the carrots, -	24	50
Oct. 26th to Nov. 12th, fifteen days labour harvesting, - - - - -	15	
	$ 79	50

1818.—*Essex, ss. Nov. 26th.* Then the within named David Little and Stephen Little, personally appeared and made oath to the truth of the within statement before me.

SILAS LITTLE, *Justice of the Peace.*

Essex, ss. Nov. 26th, 1818. Then personally appeared Tristram Little, and was sworn to the faithful discharge of the duty of surveyor of lands before me.

SILAS LITTLE, *Justice of the Peace.*

These certify that the foregoing carrot bed, on which Mr. David Little has put in his claim and received a certificate for the premium, contains one acre precisely.

TRISTRAM LITTLE, *Surveyor.*

One acre of potatoes, as measured by Philip F. Cowdin, were planted the first of June, part in trenches and part in

hills three and an half feet apart, the quantity of seed, thirty-six bushels planted whole; say those in the trenches thirteen inches (or there abouts) apart, the size of a goose egg, and two in the hill of a similar size—were hoed the first time about the 25th of June; the second and last time about the 15th of July—were dug between the 18th and 24th of October, and were by actual measurement four hundred and ninety-eight bushels and an half. The manure used was twenty-two cart loads; one half winter or raw, the other summer or rotten; the former yielding more in quantity and better in quality than the latter, being entirely free from the attack of the wire worm. The product of the hill and trenches in bushels nearly equal on the same space of ground; the potatoe in the hill, however, was of a larger size. The ground on which the above potatoes were raised, was what is generally termed old field, and was sowed the year preceding with spring rye, without manure.

PAYSON WILLIAMS.
AARON BOLTON.

Worcester, ss. October 24th, 1818. Personally appeared Payson Williams and Aaron Bolton, and made oath, that the above statement by them subscribed, contains the truth and nothing but the truth, before me.

CALVIN WILLARD, *Justice of the Peace.*

The Committee, consisting of E. Hersy Derby, General Gardner, and Nathaniel R. Whitney, Esq. to whom were referred the trial of Working Oxen, beg leave to report as follows:—

That seven pair were entered for trial. Two waggons, weighing 14 cwt. 2 qrs. each, loaded with stone, and weighed in Mr. Dearborn's platform balance, were made to weigh 49 cwt. 2 qrs. each, including the waggon, and were drawn each by a yoke of oxen from the division of the

road near Mr. Winship's up the hill as far as the tavern. Here a trial of their skill in backing the loads was made, and the teams returned to the division of the road.

Your Committee took into consideration, not only the strength of the oxen, but also their age, size, equality of match, and any other general circumstances.

All the oxen were so good, and performed so entirely to the satisfaction of the judges, that they found it extremely difficult to decide; but after a great deal of consideration have awarded as follows:—

The first premium of forty dollars to Hon. John Welles, of Dorchester.

Second do. of thirty dollars to Asa Rice, of Worcester.

Third do. of twenty dollars to Aaron D. Williams, of Roxbury.

All which is submitted by order of the Committee.

E. HERSY DERBY, *Chairman.*

Brighton, 16th Oct. 1818.

COMMITTEE ON INVENTIONS.

Your Committee for the inspection of Inventions, have attended that duty, and beg leave to report:

That only two threshing machines, and one plough were offered for premium.

The threshing machines belonged, one to Mr. Elihu Hochkiss, of Brattleborough; and the other to Messrs. Gay and Bullard, of Dedham. The plough was presented by Mr. Jesse Warren, of Dedham.

Your Committee, after hearing the evidence as to the power of these machines, and the expense requisite in working them; and after having examined them and seen them worked, are of opinion, that the one belonging to Mr. Hochkiss is the most simple, and least expensive machine of the two, and easier transported from place to place. They also consider that this machine, from its construction,

is least liable to get out of order; but they are sorry to find, that neither of the machines are calculated to thresh mixed or mowed grains, as they require that the heads of the rye or wheat should be presented first to the roller. They are however compelled, under your rules, to award the premium to Mr. Hochkiss, in consideration of the properties in his machine before stated, as well as because they think his machine threshes wheat and rye more thoroughly than the other; and your Committee are of opinion, that if this machine could be so altered as to thresh mixed or mowed grain, it would be highly deserving general attention among the farmers of this state, both on the seaboard and elsewhere.

Your Committee recommend, therefore, that the premium of 75 dollars be paid to Mr. Hochkiss.

Your Committee are of opinion, that the plough offered by Mr. Warren contains nothing new, except the cutter, which is good only on land clear of stones, and because said cutter is not the invention of said Warren. They have, therefore, given him no premium.

SAMUEL G. PERKINS, *Chairman.*

West Springfield, 9th April, 1818.

MY DEAR SIR,

THE communication which I made you in November last, respecting my potatoe crop, was not of such a nature as to require any apology for neglect, even if that had taken place, nor did I consider it as entitled to the flattering notice you feel disposed to give it. The crop was unusually large, but not attributable to any thing new in the mode of cultivation or to any exertions of the cultivator. If, however, you think any part of the communication worthy of publication, you are at liberty to extract such part of it as you please, and give it publicity.

In answer to your enquiry "whether there was any thing peculiar in my soil, which should occasion so extraordinary a result?" I do not know that there was. Nor do I know of any cause to which I can attribute my success in this instance, and by which I could regulate my practice so as to produce a similar result upon another trial.

The ground was a rich loam, situated upon the eastern declivity of a hill of gentle ascent, and was undoubtedly enriched and enlivened from the annual fall of the leaves from the neighbouring wood. As the bushes and briars were mown off in August 1815, and as the crop of 1816, owing to the extreme cold and drought of the season, was light and did not exhaust or impoverish the soil, it was in effect new land. In the spring of 1817 it ploughed up very mellow and lively.

I have, in two former instances, had an unusually large crop of potatoes, though no measures were taken to ascertain the quantity. They were the second year's crop from turf land which I had ploughed, manured and planted two years successively.

With regard to the quantity of manure put upon the ground, it is impossible for me to state with precision. No expectation of an extraordinary crop was excited, and no reference was had to any experiment. The principal object in view was to put the land in a suitable state to lay down for mowing. My usual practice is to plant no more ground than can be well manured; generally, at about the rate of twenty loads to the acre. And it is probable that this was about the quantity used in this instance.

The principal part, if not the whole of the manure was taken from my sheep pens. These are littered with straw through the winter as often as is necessary to give the sheep a clean bed, and save their wool from filth.

I have no copy of the letter which I formerly wrote you upon this subject, but I think that I then stated the mode

in which I apply manure on planting ground. So far as I can judge from my own experience, and from my observations on the practice of others, I consider this mode of application preferable to any other.

The aspect of the ground, the condition of the soil, the kind of manure, and the manner of using it, were each of them favorable for a good crop. But they by no means satisfactorily account for the result. These, however, so far as it depended on human choice and human exertions, were the principal causes to which I have been led to ascribe it.

After gathering my potatoes, I sowed one acre of the ground with wheat. It looked well at the commencement of winter, and, I think, is not killed by the frost. But it was sown too late to expect a large crop.

If at any time, it should be in my power to contribute any thing to the stock of agricultural information, or to the encouragement of gentlemen who are devoting their time and talents to the promotion of the vital interests of the Commonwealth, it would prove a source of real gratification. But my situation and pursuits do not admit of my bestowing so much attention to this subject, as to enable me to become a very useful correspondent.

I am, Sir, with the highest esteem,

Your friend, &c.

SAMUEL LATHROP.

West Springfield, Nov. 15th, 1817.

HON. JOSIAH QUINCY,

DEAR SIR,

In the summer of 1815, I purchased a lot of land, about three acres of which lay upon the side of a hill facing to the east. The upper part was very steep and set to wood. The lower part was of gentle ascent, and had been neglected by the former proprietor as unworthy of attention, ex-

cept for occasional feeding among the bushes and briars with which it was overrun. For some distance below the wood, the ground was full of springs, which rendered the land so wet, that it was unfit for cultivation, and some of the springs were so large as to overflow the land quite to the foot of the hill. At the time of my purchase, I had this part of the lot in view, together with a piece of swampy land, as susceptible of the greatest improvement.

My first object was to cut off the springs, which was, in a good degree accomplished, by opening a drain across the lot, a little below the head of the springs. In the latter part of August, the bushes and briars were all cut, and in the spring of 1816 the ground was ploughed for a crop of potatoes. After ploughing, a coat of manure was spread upon the ground, and harrowed in as well as could be done, considering the nature of the ground and the kind of manure that was used. But owing to the extreme cold and drought of that season, the potatoes having been planted rather late, the crop was light. Last spring, I had the ground ploughed in good season, spread on a heavy coat of manure, then ridged it up by turning two shallow furrows together, and planted the potatoes on the ridges. The rows were about three feet asunder, and the hills at about the same distance in the row. The quantity of land planted, was one acre and sixty rods, and the produce was 850 bushels.

As my drain did not entirely cut off the springs, a part of the ground continued so wet, that it produced but little, and still further down, the crop was injured by the shade of the woods. Take one acre across the lower part of the piece, and the produce was not less than 700 bushels.

The manure which I used, and which I uniformly select for my potatoe ground, was taken from my sheep pens. These are kept well littered during the winter. There is sufficient nutriment in it to give immediate vigour to the plants. The strawy parts keep the ground loose during

the early part of the season, and as they decompose, continue to afford fresh food and nourishment for the plants. I have had better success in raising potatoes with this kind of manure, than with any other, or than with that which was well rotted.

By ridging the land, the principal part of the manure is brought upon the ridge, and slightly covered with earth. After making the hole for the reception of the seed, a single stroke of the hoe will bring a portion of the manure into the hole, and if the seed is covered by walking in a contrary direction from that in which the holes were made, a sufficient quantity of manure, mixed with earth, will be laid upon the seed. As I hoe potatoes but twice, in both instances I plough towards the hill, though, where the ground will admit of it, in transverse directions. In this mode, the crop derives a greater benefit from the manure, than if it was spread upon the ground before ploughing. Where the latter practice is followed, a part of the manure is buried so deep, that much of its virtue is washed below the reach of the plough, and below the roots of the plants, and is therefore in a great measure lost. For many years I have uniformly put on my manure after ploughing, both for corn and potatoes.

I am, Sir, with the highest respect,
Your very obed't servant.
SAMUEL LATHROP.

Brewster, Nov. 10th, 1818.

DEAR SIR,

WITH the most cordial thanks for your friendly communications respecting the culture of wheat, I now forward to you the result of an experiment which I was earnestly desirous of making, for the benefit of this section of our country.

You may recollect, Sir, that the season was so far advanced before I applied for the seed, and could obtain it at this distance, that it was deemed extremely hazardous, and almost chimerical to attempt the growth of it the present year. But having a piece of land, as I conceived, well adapted, and suitably prepared, which I was about to lay down to grass, and unwilling to lose the present opportunity, the wheat was sown, though with little prospect of success, April 25th, and reapt August 1st, completely fit for the harvest.

Had I received the seed much sooner, the land could not have been prepared earlier, for its reception, through an abundance of rain; the soil being stiff and heavy, and partly of a clayey loam, and lying in the form of a gradual rise and swell, succeeded by correspondent vales, which were long covered with water.

Of this land a half acre lacking 5 rods was set off by admeasurement for the wheat. From three pecks of seed, after soaking 24 hours in weak brine, and being repeatedly stirred, two quarts of chaff and foul seed were taken, the residue, after being rolled in lime, was sown on the above land.

Late as was the season of sowing, such a quantity of rain subsequently fell, as to cover a quarter part with water, so long, as actually to drown the seed, leaving not more than three eighths of an acre on which the seed took.

From this three eighths of an acre a crop was taken yielding by admeasurement eight bushels three and a half pecks, of good sound wheat, perfectly free from any appearance of blast or smut. Such it has been pronounced to be, by several good farmers who have seen it.

Had it not been considerably tangled by some hens, and a portion of it trampled down near some cherry trees, I presume the produce would not have been less than nine bushels.

The success of the experiment I presume will gratify you; and that gratification will probably be augmented by the assurance that several have applied to me for seed, with a determination to attempt the culture of wheat the following season. That you may receive a similar gratification from your various attempts to promote agricultural improvement, is the fervent wish of

Your obliged friend,
J. SIMPKINS.

N. B. Two crops of Indian Corn had been taken the two preceeding years from the land, at which time it was dunged in hills, and the present season had a light covering of barn and compost manure. But the parts most plentifully manured were those where, by reason of water, the seed failed.

John Lowell, Esq.
Corresponding Sec'y Mass. Agric. Soc.

Salem, Jan. 1st, 1819.

[To J. Lowell, Esq. Corresponding Secretary.]

DEAR SIR,

In compliance with your request, I send you an account of two crops of Carrots raised in my neighbourhood, the last season.

One by Mr. Erastus Ware, to whom the premium for Carrots was awarded the last year, was on 138 rods of land; the soil a good deep loam, and the third year in succession that one half of it has been appropriated to the culture of Carrots. Five cords of fine compost manure, being about one quarter night soil, was spread evenly on the ground, and being beat down by the frequent rains, was ploughed deep four times, harrowed and pulverised as

fine as possible. The seed was sown the 25th May, in rows fourteen inches apart, by a very simple drill machine. They were three times weeded, and dug early in November, and weighed at the hay scales 44576 pounds, equal to 51682 pounds, or 23 tons, 1 cwt. 1 qr. 22 lbs. the acre. Value of an acre 51682 pounds or 923 bushels of 56 lbs. at 35 cts. $323 05.

The other by Mr. Ebenezer Thrasher, on 148 rods of land sloping to the south west, part of it light, and part a deep soil; cultivated with carrots, beets, and radishes the preceding year. Twelve cords of manure, horse dung and night soil mixed, were evenly spread, and the land three times ploughed.

Was sowed on the 18th and 25th May, with carrot and radish seed mixed, in rows of fifteen inches apart, weeded five times during their growth, and dug the last of October and beginning of November.

During the season, radishes amounting to $73 73 cts. were sold from the piece.

18 horse cart loads of carrots weighed at the hay scales	23814 lbs.
227 bushels sold by measure equal to	12712
	36526

equal to 39487 lbs. or 17 tons 13 cwt. 2 qrs. the acre.

Value of an acre 39487 lbs. or 707 bushels of 56 lbs. at 35 cts.	247 45
Radishes in the same proportion	79 70
	$327 15

Mr. Thrasher's carrots were uncommonly large.

Yours, with great respect,

E. HERSY DERBY.

ON THE PREPARATION OF FLAX AND HEMP WITHOUT STEEPING.

[From the Repertory of Arts, Vol. 31.]

ACCORDING to the census of 1810, 1,090,320 yards of flaxen cloth, and 60 yards of tow cloth were manufactured in one year in the State of Massachusetts. Hemp, of which 6000 tons were raised in a year in Kentucky, has been cultivated with success and profit on the interval lands of Connecticut river at Springfield and elsewhere. If the culture of these commodities has been progressive, which we have no reason to doubt, nor that it will continue so, it may be presumed that a respectable number of the farmers in Massachusetts have a direct interest in the information which the following paper discloses. No description is given, at full length, of the machines used in preparing the flax and hemp, but if the mind is satisfied that the process pointed out is preferable to water-rotting, the mechanical ingenuity of our countrymen will soon supply all that may be wanting to put them in full possession of the benefits of the discovery. The account, from *Les Archives Philosophiques* &c. of a similar process used in France, will be found interesting, and taken in connexion with that of the English, gives us the important fact, that the result of a simultaneous investigation of the subject in both countries, under authority of the respective governments, was a decided preference and recommendation of the new method over that by water steeping or dew rotting. A short abstract of the different statements would have afforded all that was substantially important to be known by us in this country, but we thought it might not be wholly useless to show the manner in which the investigation was conducted in England.

ENGLISH ACCOUNT OF MR. LEE'S INVENTION OF A NEW MODE OF MANUFACTURING HEMP AND FLAX, PUBLISHED IN 1815.

About two years ago Mr. Lee took out a patent for obtaining hemp and flax directly from the plant, by a new method. He has established a manufactory for the purpose near London, where his method and the result of it may be seen. Mr. Lee's invention is considered the greatest improvement ever introduced into the linen business, and is likely to occasion a total change in the whole of our bleach-fields. Hitherto the only way of obtaining hemp and flax has been to steep the plants in water till they begin to rot. They are then exposed for some days to the sun, spread out upon the grass, after which the woody part, now become very brittle, is removed by the flax mill, the nature of which is too well known to require description. By these processes the fibres of the flax are weakened, and a considerable portion of them is altogether destroyed and lost. The flax too, acquires a greenish yellow colour, and it is well known that an expensive and tedious bleaching process is necessary to render it white. Mr. Lee neither steeps his flax nor spreads it on the grass. When the plant is ripe it is pulled in the usual way. It is then threshed by placing it between two grooved wooden beams, shod with iron. One of these is fixed, the other is suspended on hinges, and is made to infringe with some force on the fixed beam; the groves in the one beam corresponding with the flutes in the other. By a mechanical contrivance, almost exactly similar, the woody matter is beaten off, and the fibres of flax left. By passing these through hackles, varying progressively in fineness, the flax is very speedily dressed and rendered proper for the use for which it is intended. The advantages of this method are manifold. The expense of steeping and spreading is saved; a much greater produce of flax is obtained; and it

is much stronger; the fibres may be divided into much finer fibres, so as to obtain at once, and in any quantity, flax fine enough for the manufacture of lace. But the greatest advantage of all remains yet to be stated. Flax, manufactured in this manner, requires only to be washed in pure water, in order to become white. The colouring matter is not chemically combined with the fibre, and therefore is removed at once by water. It is the steeping the flax and hemp which unites the colouring matter with the fibres, and renders the subsequent bleaching process necessary. Thus by Mr. Lee's process flax and hemp are obtained in much greater quantity, of much stronger quality, and much finer in the fibre, than by the common method, and the necessity of bleaching is altogether superseded. The great importance of such an improvement must be obvious to every one.

REPORT OF THE COMMITTEE OF THE HOUSE OF COMMONS ON PETITIONS RELATING TO MACHINERY FOR MANUFACTURING FLAX, MAY 23d, 1817.

The Committee to whom the Petition of Samuel Hill and William Bundy, and also the petition of James Lee, were referred, to report the same, with their observations thereupon to the House, have examined several witnesses in support of the allegations of said petition, and agree upon the following Report.

The Committee proceed to take into consideration the petition of Messrs. Hill and Bundy, on their improved method of preparing flax and hemp, in a dry state, from the stem, without undergoing the former process of water-steeping or dew rotting. Your committee received satisfactory proof, that the preparing flax and hemp, in a dry state, for spinning, answered most completely, and was likely to prove a great and valuable improvement, both to the grower and the manufacturer; the cost of preparing

being less; avoiding the risk of steeping, which is considerable; a great saving also in time and materials. It was proved also to your committee that the strength and quality of cloth manufactured from flax thus prepared, are much superior to that produced from flax, which has been water steeped or dew rotted. Your committee are fully impressed with the great national advantages likely to result from this discovery, by which it would appear, that a saving in the proportion of ninety to thirty-three would be obtained on the annual growth of flax in the empire, computed at 120,000 acres, affording an increase of employment to many thousands, and an augmentation of the national wealth, to the amount of many millions, as will more fully appear by reference to the evidence in corroboration of the allegations set forth by the said petitioners.

It appeared also in evidence before your committee, that the flax prepared by Messrs. Hill and Bundy's machines was superior to any dew-rotted flax; and that large orders had already been given for flax thus prepared, by the house of Messrs. Benyon, & Co. at Leeds, one of the most considerable manufacturers of Flax in the kingdom.

Your committee proceeded to the consideration of the petition of James Lee. Evidence on the part of Mr. Lee was produced to shew that Mr. Lee's machines were in use in various workhouses, in different parts of the kingdom; that Mr. Lee's manner of preparing flax was without water-steeping or dew-rotting; and affords additional proof of the great advantages of the practice.

Your committee must also call the attention of the House to the essential benefit that will be derived to the cultivators of flax, from the quantity of valuable food for cattle, obtained from the new method of preparing flax. It has given proof, that the boon or outer coat of flax, contains one sixth of the gluten of oats.

MR. JOHN MILLINGTON'S EVIDENCE.

What are you? I am professor of mechanics at the Royal Institution.

Have you seen Messrs. Hill & Bundy's machine at work, preparing flax and hemp for the spinner? I have.

What is your opinion of the effects produced by the breakers in the first process?

It seems to answer the purpose of taking off the boon or woody part from the flax: I observed that this was pretty effectually done by once passing through the machine, which consists of five rollers. I accurately weighed myself, (first adjusting the scales, and seeing that they were correct) one avoirdupois pound of the stem or flax in its dry state, as it comes from the farm; it required five minutes to pass this through the machine, but I took care not to let the man know that I was timing him, lest he should make an extraordinary exertion, and he seemed to be working at the ordinary rate which he could continue to work for a length of time. I found, upon weighing the product when it came from the machine, there was a loss of nine ounces and three eighths; consequently six ounces and five eighths of useable materials were obtained, that is, of fibre or harl, as it is called generally.

It was then passed through the second machine, called the rubber, or rubbing machine; this required eight minutes for the quantity which was left: the result of this was four ounces and a quarter of harl or fibre in a clean state, fit for the hackle; some gentlemen present observed, that it was scarcely clean enough, and it was passed through a second time; we divided the quantity into two equal parts, and the second process took three minutes, but if the whole quantity had been used, I do not think that it would have required more exertion. The whole process for the pound took sixteen minutes, and the loss upon weighing it, after the process, was exactly three fourths,

without a fraction; so that there was one fourth of very good and soft fibre produced, fit for the hackle.

How far are you of opinion that the hackling process completes the material for the spinner? I have seen the process of hackling by the hand; and I have likewise seen the model of hackling machinery, invented and made by Fenton, Murray and Wood, of Leeds, which by certificate sent to the Society of Arts, appears to be the best machine that had ever been constructed up to that time. I certainly conceive this to be an improvement, but at the same time I think the machine, as it now stands, would admit of further improvement as to velocity; it appears to me to do the work very well, but I have my doubts whether in its present state it will do that work with sufficient rapidity.

What quantity do you suppose a man will be capable of doing in a day? That will be answered by a prior calculation which I made when there were one man and a boy at work; but at the same time I ought to state, I tried the power, and it was nothing like the power of a man; one man might with facility turn several such machines, though each would require a child to attend, for the purpose of feeding and taking out the product.

What is your opinion as to the machine being liable to be easily put out of order? I do not conceive it is subject to get out of order; the rubbing machine will no doubt be subject to considerable wear in the rubbers, but those merely consist of little pieces of beach wood, which may be replaced at any time, by any carpenter in the neighbourhood where the machine may be.

Is not turning three machines too much for a man? I do not conceive it is at all.

Children may supply the rest of the work? Certainly, without doubt.

Have you made any experiments as to the nutritive quality of the chaff? I have not myself made the experiment,

but I requested Mr. Brande, who is professor of chemistry at the Royal Institution, to make the experiment, and I have seen the analysis myself going forward; the result was obtained only this morning; and it appeared to be one-eighth of actual nutritious matter from the quantity experimented upon. Another quantity which appeared to have been materially injured by the weather, which must be explained by some other witness, for I do not know how it came so, yielded one twelfth of nutritious matter, that appeared to me as of the worst quality, and as if it had been subject to wet weather, and had a portion of its nutritive matter washed from it.

Would not that which had gone to seed have less nutritious matter than that taken before seeding? Yes.

Do you know the quantity of nutritious matter in straw and hay? I have not had an opportunity of trying it.

Is there any oil in it? We have not had an opportunity of examining it; but I expect there is, and the general idea of oats is, that there is about one-fourth part of waste, taking it altogether; that the oat itself contains three quarters of nutritious matter, and one quarter in the shell and waste.

It is probable, therefore, that this chaff must be a nutritious food. If this is the case, the nutrition would be about six to one; it would require six pounds of this to render nourishment to a horse, equal to one pound of oats. Mr. Sewell, of the Hounslow Flax Mills, informed me, that he had been in the habit of offering it to his horses, and that when they were accustomed to it, they would leave clover chaff to come to this food.

Are you of opinion that Messrs. Hill and Bundy's machine may be of use to farmers and cottagers at their own homes? I should conceive, in answer to that, that the machine would be too powerful and expensive for small farmers, but that they would be highly beneficial, if they were introduced into districts; for instance, in a work-house or any parish establishment, where eight or ten such small farmers might have access to them.

Have you seen the calculations made by Mr. Hill respecting the number of people that might be employed, if those machines were general? I have seen those calculations.

What is your opinion of them? I believe they are correct, with the exception of one circumstance; I calculate the quantity taken in his pamphlet is rather under what I take it myself. On a supposition, that there are 120,000 acres of flax and hemp annually grown in Great Britain and Ireland, and that on an average three tons of stem are produced, from this number of acres will be 360,000 tons.

By the operation of Messrs. Hill and Bundy's machines, one quarter of the above quantity is obtained in fibre, or - - 90,000 tons.

But by the old process of dew-rotting, only one eleventh part of the above 360,000 tons is procured, or - - - - 32,727 tons.

Giving an excess of fibre saved by the new process, from the same number of acres, amounting to 57,273 tons; in pounds 128,291,520.

Now, as on an average it will require half a pound of flax to the yard of linen cloth, this number of pounds would annually make 256,583,040 yards of linen cloth from the additional quantity of flax, hemp, and tow, procured from the same number of acres grown. This quantity of linen cloth selling in the shops, on an average of two shillings per yard, would give an annual increase to our national wealth, from the same number of acres employed in this cultivation, of *l.*25,658,304: exclusive of the cost of the raw material, and the expense of preparing it by Messrs. Hill and Bundy's machines, the expense for spinning and weaving it into linen goods, is taken at 52*l.* 17*s.* 8*d* per ton. This cost of labour on the quantity of flax, hemp, and tow, saved by the operation of these machines, viz. 52,275 tons from the 120,000 acres, would amount to 12,114,747*l.* 2 shillings, and which would yearly give employment to

807,649 persons, calculating the value of the labour of each at one shilling per day the year round, and estimating them to work 300 days in each year. This average will not be considered too low, when it is considered, that a large portion of the labour is performed by women and children.

Do the machines of Messrs. Hill and Bundy resemble those of Mr. Lee? I do not myself see any similarity.

Do you conceive those two machines to be likely to produce great national advantages? I certainly think that as far as employment of the poor can produce that, they do hold out very reasonable and fair ground for supposing that a novel branch, or rather an extended branch of manufacture may be introduced into this country, by the improved process of manufacturing flax. There is a great prejudice existing in the country among farmers, from the circumstance of flax making no return to the land; it is unlike other crops, in as much as it is pulled up by the roots, instead of being cut; and by the old process, all that was nutritious in it was wasted or washed away by the process of water steeping; whereas from the analysis, which has just been mentioned, it appears that if the product should be wanted for food, that flax is as capable of making a return to the land as any other crop. Another material advantage in the present process is, that instead of the flax becoming ripe at nearly the time of corn harvest, and requiring to be attended to immediately, it may now be dried in the same manner as hay, and laid up in barns, so as to afford winter employment to farmers' servants and others, at a season of the year when employments very rarely exists in any other form. It would therefore enable the farmer to keep a greater number of servants, with advantage to himself and to the other parts of his farm, than he would want to do if he did not encourage this kind of culture.

It would be highly beneficial also in wet weather? Yes, it would afford means for employment in wet weather.

Have you any mode of calculating the expense of the old process, compared with what it would be by the improved system? I have not.

You said it would require sixteen minutes to pass through both machines, separately; would not both machines work at the same time? Certainly; but it would require preparation between the two processes; there is no doubt but that the two machines might be working at the same time, though, as this was an experiment upon a particular quantity, one machine was standing idle while the other was in use.

Then a pound might be done in eight minutes? A pound would be done in eight minutes, and part of another pound begun; because part would have passed another machine, and you would have had a lapse of three minutes upon the second machine.

What you speak of is a pound of rough material? A pound of flax in its dry state, as it comes immediately from the farm.

How many pounds of flax could be produced in twelve hours, and by what number of hands, by the machine? Twenty pounds, by one man and two children.

Would that machine require the full power of a man, or could he work more machines than one? He could work two machines with three children.

Then the three machines would require how many hands? One man and three children.

They would do sixty pounds? Thirty pounds; twenty pounds the pair of machines, and ten the other machine.

Have you seen the flax-dressing machine employed? I have; and I have stated respecting that, that it went too slow.

Do you know the quantity it would dress in two hours? No, I do not.

Do you know the waste? The waste on what I saw was very little; I merely saw one handful passed through it,

and the waste was not a fortieth, I should think; but it was not weighed.

Is Mr. Lee's or Messrs. Hill and Bundy's the most simple? Certainly Mr. Lee's is the most simple.

Do you apprehend that Mr. Lee's, being the most simple, is less liable to be put out of order? Certainly it is. That part of Messrs. Hill and Bundy's, that is more liable to be put out of order, consists of beech wood, that could be put in order again by any common carpenter? Except the rubbing part, that contains wheels and some degree of intricacy.

With regard to the rollers, they are not liable to be broken? I conceive not; the only part which would be subject to wear, is the pivots on which they turn, and they could be replaced very easily.

Mr. Lee's machine, you said, had not the effect of separating the woody part from the fibres? The beating process separated it most effectually, but not the rollers; and I ought in justice to say, that Mr. Lee told me, that that arose from the flax not being sufficiently dry; and I then had Mr. Lee's assurance, that it would answer if dry.

Do you suppose the small rolling machine of Lee would complete the business well, if the flax had been good or formed into a skein? I should doubt it very much, without the application of the breaking machine.

Will not the rollers in Mr. Lee's patent tend to divide the fibres, and render the flax finer when brought to the hackle? Certainly; any pressure upon the stalk of the flax so regulated as to cut the fibre, will tend to spread or open it, and make it finer; but that is equally well answered in the rubbing process, for there it is spread; and in the other machine, a simple roller without fluting would answer that purpose.

SAME SUBJECT CONTINUED, FROM LES ARCHIVES PHILOSOPHIQUES POLITIQUES ET LITERAIRES, NO. 2.

It is three or four years since Mr. Lee, in England, discovered the means of preparing flax and hemp without steeping. He obtained a patent. Last year Messrs. Hill and Bundy conceived and executed another system of preparation, which is affirmed to be much preferable to Mr. Lee's method.

The French government, which suffers nothing to escape that can contribute to the national prosperity, has ordered researches to be undertaken at the Conservatoire des Arts et Metiers; and M. Christian, director of this establishment, has bestowed upon it all the attention which it merits; but instead of seeking to find out the mode employed by the English, upon the imperfect accounts which have reached France, he treated it as a question entirely new and unsolved, and his efforts have been rewarded with complete success.

The new method employed by M. Christian is very simple and expeditious; it can be used every where; it requires neither apprenticeship, nor much expense; it is in a manner within the compass of any fortune; and as far as they can be compared, it is equal to the best English system.

The writer of the paper here gives a history of the ancient and modern modes of preparing these plants up to the period of Mr. Lee's discovery, commenting at the same time on the disadvantages of steeping. He then proceeds to give the substance of Mr. Millington's evidence, and goes on as follows:—This evidence of Mr. Millington's is the principal account, which France has obtained, relating to the new English processes; and although we do not find in it an explicit detail, either of the precise form of the machines, of their particular construction, or of the manner in which they are employed, we can at least

appreciate the double system, and compare it with the process discovered in France, and which is entirely different from those of Mr. Lee and Messrs. Hill and Bundy.

It would not be difficult, however, to cause machines to be constructed according to the above described systems, notwithstanding the imperfect description given in the report of the committee of parliament; but we believe our own method is preferable in many respects.

In order to reduce the flax and hemp from the state in which it is gathered to the point proper for hackling, three distinct operations are requisite, which we are able to execute in a manner simultaneously, or at least by the same machine; that is to say, 1st. To flatten the stalk, and to break the woody matter into small pieces length ways; 2d. To crack the woody matter into small pieces again, cross-ways, and to separate them from the fibres; and 3d. To divide and soften the fibres. We obtain these three effects completely by a single machine, composed of two pair of fluted or grooved cylinders, to which are communicated by a handle different degrees of velocity, with a double train.

The first pair which we shall call the *feeding* cylinders, are of iron, of a small diameter, and are fluted longitudinally with angular flutes, not sharp. The second pair, which we shall call the *combing cylinders*, are of wood with iron axles; the flutes or grooves are parallel to the axis, and can be taken off and replaced at pleasure. The grooves are of hard wood, but the edges are covered with plates of iron cut perpendicularly to their length into small flat teeth, rounded at the top and polished on every side; these plates are fitted firmly to the upper part of the grooves; and they are so arranged, that lightly fitting one into the other, their lateral faces rub one upon the other, and do not suffer the plates of iron to touch the wood upon any point in the course of the revolution of the cylinders. The flax stems are distributed parallel and equally upon a board, and kept in this position transversely by a piece of

wood that supports a spring. The points of the flax stems are made to enter the feeding cylinders first, which flatten and begin to break them according to the thickness of the cylinders. These cylinders make one turn, while the combing cylinders make fifteen or eighteen; the little teeth of these cut the outer coat longitudinally, and gradually detach it from the fibres. The fibres are softened and divided by the rubbing of the surfaces of the grooves, and by the action of the small teeth in the rapid rotation of the combing cylinders. Thus we see, that the fibres of flax or hemp come from the combing cylinders entirely separated from the outer coat, divided, softened, and ready to be hackled for making ropes or ordinary linen. The operation is entirely terminated in one minute.

Flax and hemp may be brought to the utmost fineness by taking them from the combing cylinders, washing them in cold water, and immersing them for two or three hours in water slightly acidulated with sulphuric acid, in which they become white and acquire a great degree of fineness. They are dried and softened on the same machine, having in the place of the combing cylinders, two cylinders of the same form; but the plates of iron on the grooves are rounded, instead of being toothed: lastly, they are hackled, and the fibres of the flax and hemp come from this supplementary operation white, silky, and fit for making the finest linen and lace. Our process is extremely simple. The machine is easily constructed, and not expensive; it is even, of small bulk. We cultivate as much flax as they do in England, and we may consider the discovery as even more important to France than to England.

Paris, (Me.) Dec. 18th, 1817.

[Richard Sullivan, Esq. Rec'g Sec'y of the Massachusetts Agricultural Society.]

Sir,

Agreeably to the request of the Massachusetts Agricultural Society, the citizens of this and the adjacent towns have formed themselves into a Society, and have obtained an act of incorporation by the name of the Second Agricultural Society in Oxford County. Almost every man in this vicinity is more or less engaged in agricultural pursuits, but situated in a new and remote part of the country, together with the uncultivated state of our farms, and without any particular source of information, experiment has, as yet, been but little cultivated. There now seems to be a spirit of enterprise and enquiry. We anticipate much from your Society, and every favour will be gratefully acknowledged. Our annual meeting will take place on the first week in January. We solicit some communication from your Society before the spring opens, so that we may be able to diffuse all the information in our power before seed time. We have had but two regular meetings as yet, therefore but little information can be transmitted at this time, some answers to your inquiries are respectfully submitted.

By order of the Corresponding Committee.

BENJAMIN CHANDLER.

QUERIES ADDRESSED BY THE MASSACHUSETTS AGRICULTURAL SOCIETY TO FARMERS, AND THE REPLIES MADE BY THE SECOND OXFORD AGRICULTURAL SOCIETY, IN THE NEIGHBOURHOOD OF PARIS, IN MAINE.

1st. Of what quantity of land do the farms in your vicinity generally consist?

Answer. From fifty to two hundred acres, generally about one hundred.

2d. What is the quality of the soil?

Ans. Generally good and strong, rather rocky and uneven, consisting of all the varieties from a wet and loamy to a light and dry soil; good for grass, and until within a few years for Indian corn; but since the cold seasons our lands have produced wheat in greater abundance than formerly.

3d. Into what portions of pasture, mowing and tillage, orcharding and wood, are farms usually divided? Are the orchards improving or declining? Do they yield a competent supply of cider?

Ans. About one fourth in pasture, one fourth in mowing and tillage, the remainder in wood and unimproved land. It is but about thirty years since the towns in this vicinity began to settle, and but little more than twenty since we began to improve in orcharding, which flourished very well for a number of years; but in the winters of 1808 and 1809 many of our orchards were very much injured by the severe cold, and since that time seem to be declining; those which were not so injured are improving. Some farmers produce more cider than is sufficient for their own consumption; but there is not a sufficient supply for the country. No canker worms have been yet seen here.

4th. How much land on an average is annually planted or sown with grain of any kind?

Ans. From five to twenty acres.

5th. In what manner is the land prepared, manured, and seeded with each kind of grain, and what is a medium crop?

Ans. Much grain is raised in this vicinity on new lands, after burning and clearing off the timber. Wheat is raised on old land, after a crop of corn or potatoes. The land is seldom manured, except for the former crop. Product of wheat from twelve to twenty bushels. Rye is generally grown on dry land, prepared in a similar manner, and the

crop about the same. Steeping wheat in lime and water, or scalding it in ley before it is sown, is found to prevent smut more effectually than any other method practised here. [This process of scalding is new to us. We do not recollect it among the European or American processes hitherto published. We should be glad to know at what temperature the grain is immersed, and how long it is suffered to remain in the ley.]—EDITORS.

6th. In what manner is Indian corn cultivated, and what is a medium crop on an acre?

Ans. Mostly on burnt land. The corn is planted from two and an half to three feet apart. Nothing is required afterwards, but to pull or cut up the weeds. On ploughed land it is generally planted the latter end of May, in squares about three and an half to four feet apart—seldom hoed more than twice. Crop from twenty-five to forty-five bushels an acre.

7th. What is the quantity and value of the straw on an acre of barley, rye, oats, and wheat respectively, and to how much upland hay are they respectively equivalent for fodder?

Ans. From one half to three fourths of a ton of rye or wheat straw to an acre, worth from one to three dollars a ton; but in good seasons for English grass no use is made of straw, except for manure. [*Note.*—Is it not worth more than the above prices, even for manure? It fetches ten dollars a ton in Boston for litter only.]

8th. What is the value of straw of each kind for any purpose other than fodder or litter?

Ans. None.

9th. What is the value of the stover or stalks on an acre of Indian corn, and to what quantity of upland hay is it equivalent for fodder?

Ans. About one ton to the acre, and worth from one third to one half of the same quantity of English hay.

10th. What quantity of land on a medium farm is annually planted with potatoes? How is the land prepared? What quantity and kind of manure is applied, and in what manner? How much seed is used, and how selected? How are they cultivated, and what is a medium crop?

Ans. About two acres. We plough once, dig holes about three feet apart, and fill them with coarse manure. About eight bushels of seed is used to the acre. The large potatoes are usually cut into two or three pieces, and the small ones planted whole; crop from 150 to 250 bushels per acre.

Of late some plant potatoes on stubble ground and without manure. After furrowing the land about three feet apart, the potatoes are dropped in the furrows about one foot apart, which method is thought to produce, not only larger potatoes, but a much greater quantity to the acre.

11th. How many bushels of potatoes are equivalent to a bushel of Indian corn *for sale?*

Ans. About four.

12th. How many days labour of a man are usually employed on an acre of Indian corn, including getting it in and husking it?

Ans. From twelve to sixteen days.

13th. What is the labour of shelling a hundred bushels of Indian corn, and how is it performed?

Ans. By threshing, about five days' labour.

14th. How many days labour of a man are usually employed upon an acre of potatoes, including getting in the crop?

Ans. From nine to twelve days' labour.

15th. Is there any order or succession of crops known to be beneficial or pernicious to the soil? If there is, what is it?

Ans. Flax is thought to be pernicious. Planting with potatoes, followed with rye and wheat, the stubble plough-

ed in and laid down with red clover, is deemed beneficial.

16th. What is the usual course of crops?

Ans. First potatoes, then corn, then rye or wheat.

17th. What is the average quantity of hay produced on an acre of upland, and what the labour of mowing, curing, and housing it?

Ans. About one ton, and three days' labour to secure it in good weather.

18th. What is the medium product of hay on an acre of fresh meadow?

Ans. We have no fresh meadow in this vicinity.

20th. Is any tillage land laid down with grass-seeds, without sowing grain at the same time? If so, which method is best?

Ans. None.

21st. What are the kinds of grass cut on the upland for hay? What proportion from seed sown by hand? What are the kinds thus sown, and what quantities of each respectively?

Ans. Herds'-grass and red clover. Seed from four to six pounds of clover, and two to three quarts of herds'-grass-seed to the acre.

22nd. Are any grass lands seeded after scarifying them with the harrow only, or in any other mode without ploughing, and what is the success of such practice?

Ans. None.

23d. What weeds, vermin, or seeds infest the mowing lands?

Ans. Thistles, yellow-weed, or butter-cup, and grasshoppers.

24th. Are the natural or cultivated grasses infested most?

Ans. The cultivated.

25th. What methods are used to destroy weeds, vermin, or insects, and with what success?

Ans. Frequent mowing destroys thistles, better than ploughing.

26th. What kind of beasts, and in what numbers are kept on a medium farm? And how are they subsisted?

Ans. From one to two horses; from ten to forty horned cattle, and from ten to sixty sheep pastured in summer, and fed with hay in winter.

27th. In what place, and in what manner are the cattle fed with the coarse winter fodder? Is it given in the stable, in the yard, or in the field? Is it chopped or given whole?

Ans. Good hay is given in the barn; the poorest and coarsest fodder in the yard. It is not chopped.

28th. How much butter is usually made in a year from a cow, the whole cream being churned? And how much skimmed milk cheese from the same cow?

Ans. None are so managed in this vicinity.

29th. What food is given to sheep besides grass and hay?

Ans. Corn, beans, and potatoes; but little is used in this part of the country, except hay.

30th. What is the value of the subsistence of a sheep through the year besides pasturage?

Ans. From one dollar to one dollar fifty cents.

31st. What is the value of the pasturage of a sheep compared with that of a cow?

Ans. Eight sheep without lambs, and five with lambs.

32d. What is the ordinary weight and value of the flesh of a sheep fit for the butcher? And what the quantity of wool in a fleece?

Ans. From ten to sixty pounds of flesh, three pounds of wool.

33d. What breeds of swine are propagated? How fed, how fatted? At what age killed, and what their weight?

Ans. A mixed breed, generally of small bone; fed in summer with skimmed milk and whey; fattened mostly on potatoes with some meal, sometimes with corn, and sometimes with meal of oats, or oats and peas. Killed at the age of eighteen months; weight from 200 to 300.

34th. What number of bee-hives are kept, their product in honey and wax; what management, and what obstacles to their extensive propagation?

Ans. We are beginning to keep bees; they appear to prosper very well, but we have not much experience in their management.

35th. What is the usual quantity of land sowed with flax; how manured and cultivated? And what is the medium produce of flax and seed in quantity and value?

Ans. From one fourth to one acre, manured with old manure; cultivated by repeated ploughing before sowing. Crop from 150 to 250 pounds an acre; value seventeen cents a pound.

36th. How much labour is employed on a quarter of flax before it comes to the spinner, and including preparing the seed for market.

Ans. From eight to ten days.

37th. In what consists the surplus of the farmer, which is sold or exchanged for other articles?

Ans. Butter, cheese, beef, pork, rye, wheat, beans, peas, &c.

38th. How many loads of manure are collected (estimating thirty bushels to a load) from the barn yard of a medium farm, specifying the number and kinds of cattle kept on the same farm, and the manner in which they are kept in relation to confinement or ranging abroad?

Ans. Twenty horned cattle, three horses, and forty sheep, produce sixty loads, confined in the night, and suffered to go at large in the day.

42d. In what manner, and to what uses is manure applied, except those above indicated?

Ans. To none.

43d. What other manures are used, except those produced by the stock?

Ans. Not any.

44th. Is limestone found in your vicinity, and to what uses is it applied?

Ans. It is found in many places, but not used as a manure.

45th. Is buck-wheat cultivated for food? Or is it used as a fertilizer of the ground?

Ans. It is but little cultivated, and that only for food for hogs and horses.

46th. In what manner are new lands brought under cultivation? Is it customary to plant orchards in new settlements?

Ans. The trees are felled in June, and burnt the succeeding fall or spring; the small stuff is then piled and burnt, and the ground planted with Indian corn. The next spring the timber is chopped into convenient lengths, piled and burnt, when the ground is sowed with grain and grass-seed. Many orchards are planted in new settlements.

47th. How is land cleared, which is over-run with bushes and underbrush?

Ans. By cutting and burning them.

48th. How are swamps and swampy land cleared?

Ans. Few attempts are as yet made to clear them.

49th. Is the growth of wood for fuel and timber sufficient for consumption in your vicinity? If not, what measures are taken to provide against a scarcity?

Ans. Large tracts of our country are full of wood, and of course no measures are taken to provide against future wants.

50th. How far has gypsum or plaster of paris been fairly tried in the maritime parts of our coast? What have been the effects of the experiment?

Ans. We are unacquainted with it.

51st. Is it perfectly ascertained, that with proper attention to manuring land it is more advantageous to change the crops than to keep it in grass?

Ans. No experiments of the kind have been made.

52nd. Is there any crop more profitable than grass at a distance from market?

Ans. None.

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Ans. No experiments of the kind have been made.

52nd. Is there any crop more profitable than grass at a distance from market?

Ans. None.

53d. What has been found to be the difference of profit between merino and other sheep?

Ans. Many people in our country, from prejudice or some other cause, dislike merinoes. We think the profit of them nearly double the old stock of sheep.

54th. Is there any fodder for sheep, which will diminish or supercede the consumption of hay in winter?

Ans. We know of none.

TRANSLATION OF A LETTER FROM HIS EXCELLENCY HYDE DE NEUVILLE, MINISTER PLENIPOTENTIARY OF HIS MOST CHRISTIAN MAJESTY TO THE TRUSTEES OF THE MASSACHUSETTS AGRICULTURAL SOCIETY.

Legation of France to the United States.

Washington, Sept. 28, 1818.

GENTLEMEN,

I HAVE received with great sensibility the diploma, which the Massachusetts Agricultural Society have been pleased to present to me. I appreciate, as I ought, the honour they have conferred, by associating me in their labours. My efforts, in concurrence with them, in promoting this science most useful to men, will evince, I trust, the extent of my gratitude.

I send by the present mail to the consul of France, at Boston, a list of seeds which have been sent to me by the directors and professors of the museum of natural history, at Paris.

I pray that your society will have the goodness to point out those, the culture of which may be useful to the state of Massachusetts. I shall be extremely happy to be able to render them this service, as speedily as possible.

I take the liberty, moreover, to propose the establishment of a regular interchange between me and them, of

European seeds, and those of the northern parts of the United States.

Such connexions between nations cannot but redound to their mutual advantage. They are easily formed, and it is quite time, that agriculture and commerce should cement and secure the union of nations.

Be pleased, Gentlemen, to make known these sentiments to all the members of your Society, and accept for yourselves the assurances of my high consideration.

The Envoy Extraordinary, and Minister Plenipotentiary of His Most Christian Majesty, to the United States.

HYDE DE NEUVILLE.

[The following article on artificial grasses by the President of the Virginia Agricultural Society, we have selected, not so much because the ideas are new to New England farmers, since the value and importance of artificial grasses are well understood with us, and their cultivation forms a part of the husbandry of all our farmers, but we think there are many excellent remarks in this essay, as there are in all those, which have proceeded from this gentleman. We insert it also partly from courtesy, and to shew our readers the interest which is now felt in other parts of the United States on the important subject of agriculture, and the enlightened zeal with which it is pursued.]

AGRICULTURAL SOCIETY OF VIRGINIA.

Paper communicated by the President, Col. J. Taylor, and ordered to be printed.

ARTIFICIAL GRASSES.

It is universally agreed, that a constant impoverishment of land must ensue from tillage, without the renovation produced by manure and vegetable matter—hence, the cheapest and most ample supplies of these renovators is a primary subject; as neither the improvement nor preservation of the soil can be effected without using the means. It was seen as early as in the time of Columella, that the efforts of nature to furnish us with these means, without the aid of

culture and art, were incompetent to the end; and nearly equivalent in value to the spontaneous supply of food by the wilderness, compared with the supply from industry and cultivation. Writers reason from this discovery as an axiom, and prove that the fertility of old countries bears a strict relation to the use made of it. Egypt itself owes its fertility to its annual alluvial manuring. Thus the culture of artificial grasses attracted great attention, wherever a system of agriculture existed, worthy of any degree of commendation; it being seen that the prosperity of nations, as well as of farmers, was evidently graduated by the degrees of skill and industry with which this axiom was practised upon; and that they were the chief means for its practical effect. Whilst a country is fresh and the soil saturated with vegetable manure, it constitutes a temporary case; and a vast extent of uncleared lands will long keep out of view the means for preserving the good, and improving the exhausted. But when it has passed the vigour of youth, and exhibits the marks of old age, the alternative of reducing it to barrenness, or of adopting the only mode in existence for restoring its fertility, lies before the eyes of its inhabitants. Excepting a few strips of alluvial land, there is no cultivated country, in which a dependence upon the natural grasses is more hopeless than in Virginia. A thin soil, exposed to hot and dry summers, not only prevents our lands from clothing and nourishing themselves, but has at length rendered them even unable to raise working animals for their own cultivation, and a sufficient supply of meat, milk and butter for their own cultivators. A remedy for this state of things is necessary to stop the emigration from Virginia, and to prevent its ultimate depopulation. If the culture of artificial grasses is the chief remedy, it can only be overlooked, because it is not embellished by the glittering ornaments of novelty, and only assumes the plain garb of reason and experience.

Before the effects produced by a skilful culture of the artificial grasses are enumerated, let us take a glance at them, collectively, in other countries. In Holland, where the cultivation of grass is generally preferred to that of bread, land sells higher as land, without having its price enhanced by adventitious circumstances, than in any other country. The industrious and profit-loving Dutch choose rather to import, than to raise their own bread-stuff, at the expense of diminishing the culture of artificial grasses. They are as little likely as any people in the world, to make an election by which they would lose money. In England, the cultivation of grass is so much more profitable than that of bread-stuff, as to have obtained a preference, at the expense of considerable importations of the latter. The bearings of this fact are weighty. Hay and butcher's meat in England, are nearly of the same prices as in this country—whereas, wheat there, is often three times dearer than wheat here, and seldom less than double in price. Yet the English farmers prefer raising artificial grasses, to raising wheat. Again, the rent as well as price of land, is constantly highest in those countries, where the culture of artificial grasses is pushed farthest. In England, the rent of fine artificial meadows, sometimes extends to twenty dollars an acre, rarely diminishes to ten, and is never as low as the rent of adjoining arable land, however good. As the rate of rent is settled by the rate of profit, it follows that even there, where the prices of meat and hay approach much nearer to our prices than the price of wheat, it is most profitable to raise the articles of inferior price. Much light may also be extracted from a comparison between the general rate of rent here and in England. It must be our best land, which would rent at one dollar an acre for a term of twenty-one years; and even at this low rent, both the land and the tenement are generally ruined. In England, much of the arable land rents at about ten dollars an acre, and its average rent is about six. But

there, the culture of artificial grasses is invariably mingled with the culture of grain. Now when we see the best grazing land there, renting higher than the best arable land, and their farms renting ten times higher than ours, does it not plainly follow, that both a great profit and a vast improvement of the soil must arise from the culture of artificial grasses; and that the difference in rent between their farms and ours, is in a great measure produced by the latter circumstance? This conclusion is warranted by the fact, that the longer the term of a lease is, the higher is the rent there, and lower here; because the tenant in one case, calculates upon a mode of tillage which will improve the land; and in the other, upon its becoming poorer. What but the use of artificial grasses, and their exclusion, has made both these calculations correct?

Let us now resort to indigenous facts. Lands sell and rent higher in the U. States, in proportion to the extent and skill with which artificial grasses are cultivated. There is no doubt, but that here, as abroad, profit is the only permanent basis of price and rent; and as the highest price and rent attends the culture of artificial grasses, the greatest profit must also attend it. Both at home and abroad, the land nursed by artificial grasses, is known to be so much richer and productive, both of grain and meat, than lands not so nursed, as to pay labour far better, without taking into the account a long list of other benefits arising from this system of culture. The most productive bread-stuff farms, are those whereon grain is raised on grass lays. Of this fact, the slightest observation, experience or reflection, would convince the most incredulous.

The general conclusion, that grazing ruins land, as we know from experience, when applied to natural grasses only, but enriches it when combined with a skilful management of artificial grasses, as in the cases of Holland, England, and some parts of the United States, suffices to excite those who love their country or themselves, to inquire

after the practical modes of a system, which experimentally enriches us both, and solicits an attention to the distinct items of profit, by which these desirable ends are produced.

1. The phrase "artificial grasses" implies a selection from the gramineous family, and a culture by human art, of the kinds best adapted to the soil and climate of a country, in preference to a reliance upon the grasses produced naturally. The great value of this selection, is illustrated by the contrast between the crab of the wilderness, and the cultivated pippin of the orchard; or by a comparison between the esculents of a garden and those of spontaneous production.

2. An improvement of the soil by the culture of artificial grasses, arises from the vegetable matter of both root and top, when ungrazed; from the former when grazed; from protecting the ground against heat in summer and cold in winter; from producing food to raise animal manure; from rendering the ground fit to bear deeper ploughing, by reason of the mass of vegetable matter mingled with it, that it can bear in a naked state; by which its soil is deepened, and from saving four fifths of the farm from the hoof and the tooth, by making one fifth far more adequate to supply the demand for grass, than the whole without such culture. The profit arising from this improvement of land by the use of artificial grasses, is exhaustless and incomputable.

3. Artificial grasses enable the farmer to raise meats of all kinds, for his own use or for market, of the best quality, in the cheapest modes; and to increase the size of all animals destined to slaughter or labour. The latter, by being raised in the climate where they are to work, are hardier, healthier, and better adapted for their employments. And whilst the farmer saves the expenses of purchasing sorry meat and teams, he gets good without expense; because by a skilful management of artificial grasses, the manure they cause domestic animals to produce, will more than re-

pay in the improvement of soil and increase of crops, the expense of their maintenance. This item of profit is too important to be hastily passed over. Men chiefly subsist upon grain and meat; brutes, upon grass, green or dry. The difference between the expense of cultivating an acre of grain and one of grass is inconsiderable, and yet the latter will raise far more meat, butter, tallow, leather, and wool. Let any farmer calculate the expense of supplying himself with these articles, in the present mode, even excluding its heaviest item, (that of injury to the land,) and he would probably discover that most of all of them he raises cost him three times their market value. The loss however upon what he sells is trifling, compared with the loss upon what he uses; because he consumes much and sells little. When the temporary supplies from the western country diminish or fail, the evils attending upon our present mode of raising stocks, will require no proof. The arts of agriculture are as necessary to improve and increase the sustenance of beasts as that of men. Grass being the basis of food in the case of stocks, as bread stuff is in the case of man, that mode of obtaining it which produces the most and best, with the least injury to the land, and from the smallest space, is entitled to a preference. Without the cultivation of artificial grasses, our domestic stocks occupy the precise ground occupied by mankind, when excluded from the artificial modes of raising bread stuff, and experience the fate of a state of agriculture, as to them, uncivilized.

4. The artificial grasses produce a considerable profit by saving labour. If the labour applied to an acre enriched by artificial grass, was equal to that expended upon an impoverished acre, a vast saving would still result from the difference of the crop; as the expense of labour must be computed in relation to its produce. But the fact is, that the poor land requires the most labour, whilst it produces the worst crop, because being filled with seeds of worthless

or pernicious annual grasses or weeds, and being incapable of bearing a ploughing sufficiently deep to deposite these seeds beyond the reach of vegetation, it requires double the work to destroy them as they sprout and grow after every rain, which would suffice if they were extirpated. This cannot be effected on poor land without killing it. On such the wheat which follows corn, though the corn required and received six or seven workings, is always more infested with annual grasses and weeds, than that sown upon only a single furrow turning under good perennial grasses, because they smother all animals, and any seeds of the latter remaining, are buried by one deep ploughing, which the earth is able to bear below the reach of vegetation. Hence in the culture of corn upon a perennial grass lay, as in a fallow for wheat, half the labour required by poor lands may be saved; because but few of the annuals appear after one deep ploughing, and as the perennials hardly appear at all in the summer, very little culture is required; and the crop is not only increased by the artificial grasses turned in, but by being freed from the frequent laceration of its roots, caused by frequent ploughings necessary to keep under the quick growing annuals infesting thin land. The wheat also following corn planted on a perennial grass lay is cleaner; for although the perennial grass seeds will often sprout in the spring, and although they ought universally to be sown with or upon the wheat, yet a providential aptitude for the benefits they bestow, is discernible in their slow growth until the wheat crop is perfected; whereas the annuals often grow as rapidly as the wheat itself. There are many weighty items of profit belonging to the labour-saving article, by the culture of perennial grasses. By diminishing arable space, whilst the crop is increased, the diminished space consumes less labour. From a division of the objects of labour, a succession of employments ensues, enabling a farmer to prevent either from suffering by the want of cultivation in due sea-

son. For instance, a full crop of corn and wheat, or a crop equal to the whole labour on a farm, is the consequence of comparing labour with space; and a great demand of both crops for labour at the same period, especially if aggravated by unpropitious weather, generally produces some neglect, and often a considerable loss. By diminishing space, not only without diminishing, but actually increasing produce, these crops will be more manageable by the labour, and receive a better cultivation. And the time saved by this diminution of space, is moreover profitably employed early in the spring, in applying manure and sowing grass seeds; previously to the wheat harvest, in making hay; in autumn, in ditching and draining, fencing and stubbing; and at all times in a variety of less important, but improving occupations. Thus the losses accruing both from a surplus of labour at one season, and from its deficiency at another, are avoided. Some labour is saved by the effect of the roots and tops of perennial grasses, to keep the ground loose and friable; and much, after it is thrown into high ridges of five and a half feet width, because when the ridges are reversed, very deep ploughing is more easily practicable, by turning the earth back into the furrows without working at all on the space these furrows occupy. By the friability of the ground, resulting from a great quantity of vegetable fibres, we are also secured against its baking, and save the labour necessary in that event, for crumbling or reducing it again into a proper state of vegetation. Naked ground possesses neither of these advantages. It is unable to bear the deep ploughing necessary for forming proper ridges, and it is liable both to wash and bake from heavy rains, so as to require much severe labour, again to level and pulverise it, highly prejudicial to the crop.

5. But the greatest benefit from the cultivation of artificial grasses, arises from their exclusive capacity to make highland meadows. Some grasses are so well adapted for

high, dry, and hilly land, if the soil is improvable, that it may very often be made more valuable and more productive than low land meadows. The expense of clearing and draining the latter, will generally exceed that of manuring the former; yet draining is considered every where as highly profitable and useful. The comparative expense between that and making highland grass, is not materially affected by the probable comparative profit. A good spring crop of high land grass is more common in our climate, than of low land. It is not exposed to inundation. A pound of high land grass, green or dry, generally contains as much nutriment as two of low land. It is more easily made into good hay. And highland grasses possess the great and exclusive value of enriching the high and dry lands on which they are sown. These considerations disclose items of profit, resulting from the culture of artificial grasses, which, when united, warrant the conclusion, that it is capable of rendering a great proportion of our high, dry, and hilly lands as valuable as reclaimed meadow land.

It is next to be considered what grasses are best adapted to the soil and climate of Virginia, and consequently most worthy of selection. The merit of red clover as an improving high land grass, is too well established to require proof. Its defects are, that it is speedily destroyed by grazing; bearing, however, that of hogs the longest; that in our warm and dry summers, it soon perishes without being grazed, especially on sandy soils; that it is difficult to be made into hay; and that its hay can only be preserved by particular exertions. It stands, however, hitherto unrivalled in its capacity to enrich the ground, if left uncut to be turned in by the plough. Timothy, in the lower parts of the state, especially if grazed, is also liable to an early death; to be eaten out by broom straw; to have its leaves burnt and dried by the sun before it is fit to be cut; and to ripen so late as to incommode the wheat harvest, with-

out possessing the quality of waiting long for the scythe. In the section of Virginia below the mountains, it must also be assigned to the class of low land grasses. The red top, or herd's grass, as it is indiscriminately called, is superior to timothy in many respects. It lasts longer; it bears grazing better; its leaves are not so liable to be sun-burnt; it resists invaders much more powerfully—sown, mixed with timothy, it casts out the latter in two or three years; and although it ripens about the same time, it waits longer for the scythe, without sustaining any considerable injury. This grass, like timothy, is better adapted to reclaimed low lands than to high; though it succeeds on the latter, better than timothy. The best grass which I have tried in many respects, is one commonly called "the highland meadow oat." I have had no means of ascertaining whether it is a species of rye grass, or of the avena pratensis, or neither, nor whence it derived the appellation "Peruvian," by which I have heard it distinguished. With its qualities I am better acquainted, having carefully observed them for many years. It ripens as early as the red clover, and is easily made into fine hay, if cut in proper time. Its earliness is of vast importance in our climate. Thence it happens, that it produces heavy spring crops, like red clover, as it commonly perfects its growth before a drought occurs. It is the hardiest grass I ever saw, and bears drought and frost, heat and cold, much better than any I have tried. It keeps possession of the land in spite of severe grazing. It flourishes best on soils suitable for red clover, but it will live on, and improve lands, whereon red clover will perish. It furnishes better grazing early in the spring, late in the fall, in droughts and in winter, than any grass known to me. Ripening with the red clover, it is peculiarly fitted for being sown with it, because it greatly facilitates its conversion into hay, and retains possession of the ground for years after the clover has disappeared. Alone, cut before the seed ripens, its hay is as nutritive

and pleasant to stocks of all kinds, as any I have ever used; and it will yield both seed and tolerably good hay at one cutting, as it ripens soonest at top. Mixed with favourite grasses of grazing animals, it is partially rejected, but eaten as they fail. Alone, it is greedily fed upon. After being cut or grazed, if left to grow, it rises anew, almost with the rapidity of lucerne, with a vigour but little diminished. Fifteen years' experience has not enabled me to decide as to its capacity for improving the soil, because the small quantity of seed first obtained, by confining experiments to small patches, long concealed its qualities; and the large lots first sown, have remained too flourishing to require manure, and too valuable to be ploughed up. It produces (after it has once come to perfection, in doing which it is one year slower than red clover,) ungrazed and uncut, a warmer and more lasting cover than the clover, which has recently induced me to mix and sow it with wheat on a large scale, for the end of improving the soil; in which anticipation I have yet discerned no cause for apprehension. For this purpose, it possesses one recommendation beyond clover. It does not grow and spread so rapidly in the fall or spring as to injure the crop of wheat with which it is sown, as is sometimes the case with clover. Upon the whole, whatever doubt remains as to its fertilizing power, the conclusions that it eminently possesses the qualities for lasting, grazing, and making high land hay, may, I think, be confided in. But it does not, so far as my trials have extended, succeed in lands originally wet, however well they are drained.

As the end designed to be produced by the previous observations, comprises their value, a plan for the management of a bread stuff farm, combined with high land meadows and artificial grasses, is the remaining subject suggested for consideration. Let us suppose a farm to consist of one thousand acres of arable land; that the greatest produce of bread grain, not in one year only, but in a course of

years, is the chief object; and that the labour on it is adequate to its cultivation in the three-shift mode, that is, to having two-thirds of it annually in corn and wheat. To discover whether the profit to be expected from this style of cultivation will be equal to that arising from the system presently to be proposed, we must first glance at its defects. It impoverishes the soil. Grass seeds cannot be beneficially sown with or upon the wheat crop, because the land is too poor to nourish them, and their destruction by the plough returns too rapidly. Pasturage is scarce, bad and impoverishing to the land; and the farmer is thereby disabled from raising within the farm, teams, meat, milk and butter, for his own consumption and comfort, and moreover exposed to annual expenses to supply the deficiencies. The labour being computed by space, and not by produce, and a great demand for it being concentrated in one portion of the year, losses accrue from its insufficiency to meet temporary pressures, and at other seasons for want of beneficial employment. The crop computed by the acre, is upon an average, surprisingly small, whilst as much labour is necessary for its cultivation, as, differently managed, would in a few years increase it per acre four-fold. Let us contrast this abridgment of the three-shift system, with an abridgment of that proposed to be substituted for it.

Let eight hundred of the supposed thousand acres be divided into four shifts of two hundred acres each, one to be annually cultivated in corn and sown in wheat, so that two will yield a crop every year. As much as possible of each shift should be manured the year it is planted in corn. This may be extended in a few years to one hundred and thirty acres, (exclusively of the twenty presently mentioned,) by ordinary management. Clover should be sown on the wheat in the spring, or meadow oat with it in the fall, and these eight hundred acres should remain ungrazed; of course, four hundred lie untouched for two and an half years, to allow time for a large produce of vegetable mat-

ter, devoted to the improvement of the soil. Let the remaining two hundred acres be appropriated chiefly to grass, and be divided into ten equal lots, one to be highly manured annually, and cultivated in pumpkins, potatoes, peas, cotton, turnips, or any cleaning crop, to be followed by wheat and grass seed, if these crops are gotten off in time to sow wheat, or by oats and grass seed, if they are not. Thus two lots, or forty acres of this portion of the farm, will produce each year heavy and valuable crops, whilst a rotation will be established, sufficient to keep the grass lands clean and in good heart. Three of the other eight lots ought annually to be cut for hay, and five to be reserved for grazing, out of which last number should be annually taken the lot to be manured, so that none will sustain above five years' grazing before it is recruited. The five lots devoted to that service ought to be grazed in succession, both to alleviate the impoverishment it produces and to increase the produce of grass. Hence he who aims at agricultural perfection or elegance, will divide these ten lots by ditches and live hedges of holly or cedar, (the former a conjectural, the latter a tried plant,) or at least by the usual fences. Even ditches alone would be of some use. But in the infancy of improvement, attendants of old men, women, or children, are a tolerable resource, producing also the good effect of habituating the last in early life to employment, and advancing their health, with the precaution of folding the cattle in bad weather. The temporary resource is, however, greatly inferior to inclosures, particularly to the living or imperishable. Under this system, product, instead of labour, will soon be computed in reference to space; and bad agriculture, being detected by the miserable crops this mode of computation will disclose, will shrink gradually out of sight, through shame. The means of raising manure, and the most beneficial employment for teams and manual labour, will soon present themselves in those seasons of the year now lost or trifled away.

I speak not from theory when I say, that the farm well managed, according to this system, will, in twenty years at least, return back to its original fertility. I add, as an inference from this fact, that supposing contiguous farms of one thousand acres each, one in the usual state of impoverishment and the other in woods, the former to be thus managed, and the latter in the customary mode, with the same amount of labour; that the proprietor of the first would make far more profit, and find his land at the end of the term of far more value than the proprietor of the latter. If these rival farms were in an equal state of impoverishment, at the commencement of the experiment, I have no doubt but the first would produce three times as much bread stuff in twenty years as its rival, independent of its inferior productions, and of its exclusive improvement.

A great annual increase of manure is the soundest test by which a farmer can discover whether he is successfully practising the proposed system or not. On the area from which it was taken, five acres were hardly manured eighteen years ago, and now the resources of the farm alone sometimes reach to one hundred and fifty. It is a bread-stuff farm, and grass is used in strict subserviency to that object, for the purpose of enhancing its profit. If gypsum, marle, a neighbourhood to towns, or any adventitious mode of enriching land, can be added to the supply of manure on such a farm, the process of improvement, and the gratifications of increasing profit, may be accelerated.

The large area upon which the proposed system is calculated, is no obstacle to its application to any other. Its proportions may be applied to a farm of any size. This scale was adopted for the purpose of awakening the best informed order of farmers to the calls of patriotism and self-interest. Intelligence effects great objects by reflection; ignorance from imitation; and though a prosperous state of agriculture depends much upon small farmers, be-

cause they possess by far the greatest portion of the national lands, perhaps also of the national industry, its introduction depends upon the successful example of the large ones, who have time, capital, and talents adequate to the cultivation of a science abounding in difficulties, and requiring no small degree of reflection. The merchants of Scotland, who had retired from trade, began about fifty years ago to assail, by precept and example, the then execrable system of agriculture habitually practised in that country, and have supplanted by another, which has diffused a rich service over a great space, previously occupied by a cadaverous degree of sterility. As we neither love our country less, nor confess an inferiority of intellect, an equal share of effort and perseverance by gentlemen farmers, will certainly be crowned with as much success as the efforts and perseverance of these gentlemen merchants, since our auxiliary advantages of soil and climate are greater. They effected their patriotic design, chiefly by the introduction of the artificial grass culture; and when we consider the favourableness of our climate for great spring crops of grass, frequently demonstrated by as heavy crops of clover as we hear or read of, and also its favourableness for converting them into hay, no reason exists for despairing of obtaining the wonderful state of fertility which a country, less favoured by nature, has acquired by the same means.

I admit that a farmer may make a less crop than usual, the first or second year after he adopts the recommended system, unless he begins with a due attention to manuring; but I deny that his profit will be less, because his diminution of crop will be more than compensated by the improvement of his land. An average of the first four years will probably produce a crop numerically equal, at least, to his usual crops; but then his profit will be greater, because having raised it from less space, he will have saved much labour for improvement, and his land will be in better heart.

Afterwards his crops will numerically increase gradually to an extent I cannot foresee. Should a man calculate by his hopes of life and chance for self-gratification, without any regard for contemporaries or posterity, he ought to adhere to the prevalent system of agriculture, if he expects to live two years only; if but four, his determination may admit of some doubt; but if he expects to live longer, it ought to admit of none. Even principles so narrow, will dictate to him an abandonment of the present land killing habits. A calculation which looks forward but two years, cannot possibly procure success for any agricultural system, except one for exhausting the land as soon as possible. All men, who calculate on so short an interest in the product of land, will strive to increase it to the utmost extent, at the expense of the land itself. A proprietor, sure of dying in one or two years, would improve but with little spirit, though his land was to descend to his children, but a possessor for one or two years, likely to lose the land and live, must feel a great lassitude in improving for future profit, which he cannot keep, for future enjoyment. No good system of agriculture can possibly take place, under the suggestions of these impulses.

I admit also that disappointments will happen from feeble and unskilful trials. Complete success will too often be expected from partial attempts. The imagination can magnify the disrupted toe of a statue, into an entire image, and brood over a fragment with self-complacency; and fanaticism can expect wonders from relics transmitted from ignorance; but it is to be hoped that such cases will be rare in this age of intelligence and free inquiry; that the prejudices imbibed from old habits will be exploded, and that the industry and good sense of the Virginians will rapidly improve all suggestions, the tendency of which is to preserve their country from decay, and themselves from indigence.

An observation is reserved for the conclusion of this essay, to face an opinion, not less erroneous than common; and not less hostile to profit than to improvement. It is too often imagined, that a rotation requiring the interposition of artificial grasses between exhausting crops, is slow in its return of profit, and demands an extraordinary capital, to supply for a time the necessities arising from this delay. But from long and attentive observation, I have confidently concluded, that no crop requires less capital, than these grasses, or is equally rapid in its returns of profit. The labour which cultivates other crops, prepares the ground to receive grass-seeds, and they are mingled and sown with grain. Seed is therefore nearly all the extraordinary capital this system needs, when the artificial grasses are grazed, or devoted to the enrichment of the soil; and the expense of converting a portion of them into hay, though not as trivial, is yet inconsiderable. The returns of profit are infinitely more copious and lasting, as well as more rapid, than those made by any other crop. They suddenly yield milk, butter, cheese, meat, wool and leather. Manure, an increase of grain and other crops, and good working animals, soon follow. At every rotation, when ploughed in ungrazed, they present to the farmer an improved soil, without causing additional expense, or requiring additional labour. On the contrary, so far as artificial grasses are thus used, they save him more labour in the single article of fencing, than they consume. And finally, the profit of the system becomes so incorporated with the soil, whilst it is also enjoyed by the reaper, as both to last long, and annually to generate profit upon profit, in a ratio outstripping the fecundity of compound interest.

INSECTS WHICH AFFECT THE OAKS AND CHERRIES.

It has been observed, that America is "the land of insects." This observation is strikingly just as applied to

the meridional and tropical parts of this quarter of the globe; in which these animals are equally remarkable for their numbers and conspicuous for their magnitude; but it may, perhaps, be as truly said of a great part of the northern portion of it, where, though much diminished in volume and often very minute, the observer will find them surprisingly copious. These diligent and faithful servants of nature, as Linnæus calls them, are perpetually engaged in destroying all that is dead, and in checking the increase of all that is living in the vegetable world. In the execution of the task assigned them, they often frustrate the designs and subvert the arrangements of man, thus constraining him to attend to objects which are generally deemed beneath his notice, and obliging him to feel how effective is the smallest instrument in the hand of Omnipotence.

In this paper it is intended to lay before the board of trustees of the Massachusetts Agricultural Society some notices of two insects, one of which inhabits the forest, the other is injurious to fruit trees.

For several years past the ground beneath the black and white oaks, has been observed to be strewed with small branches of those trees from eighteen inches to two feet in length. Mr. Sullivan assures me he has found them five feet in length, and an inch in diameter. The falling of these branches is occasioned by the larva or grub of an insect which, when its feeding or larva state is nearly completed, eats away the wood in a circular direction, leaving only the bark entire; this is broken by the first strong breeze, and the branch with the larva in it, falls to the ground. From this effect of its labours, it may be called the oak-pruner.

At the meeting of the Board of Trustees at the seat of Gorham Parsons, Esq. on the 23d of July last, the Hon. Mr. Sullivan produced several branches of oaks which contained larvæ. Five of these I brought home, reduced

them to four or five inches in length; and in order to determine whether the larvæ descended into the earth, threw them into a vessel nearly filled with light garden mould, covering the vessel with a piece of window-glass, both to prevent the escape of the perfect insects, if any should be disclosed, and to retard the drying of the mould.

I imagined that as the larva is enclosed in the fallen branch with a sufficient supply of nutriment to carry it through the feeding state, that it was intended it should enter the earth when that state was passed, and that it was impelled by instinct to cut off the branch, that it might be brought in safety to the ground before it was quite ready to quit the wood; but my conjecture was erroneous; there must be some other reason for this process.

A degree of humidity is necessary to favour the development of the parts of the perfect insect while it is in the nympha state; in the body and larger branches of trees the moisture is sufficient for this purpose; but in these small branches, which are killed, the moisture would be exhaled by the action of the sun and wind if they remained on the tree, whereas by their falling and being thus placed nearly or quite in contact with the moist earth, their humidity is preserved. It was not precisely with this view, that the prepared branches were treated as above mentioned; but the purpose was attained. The vessel was kept in a warm room, the wood was kept moist, and one perfect insect made its appearance in November, another in December; but I believe they would not have been disclosed till the spring, if the branches had remained abroad.

The insect belongs to a tribe composed of a number of genera called capricorn-beetles and wood-eaters. The genus of which it is an undescribed species, is named by Fabricius, stenocorus. Linnæus would have called it cerambyx. It is of a dull brown colour, a little brighter on the under side, every where dotted with impressed points, and sprinkled with short whitish hairs which lie close to the

surface; these give it a grayish hue under the magnifier. The antennæ are about as long as the whole insect, tapering a little from the base to the point, and have ten joints, of which the second and third terminate in a small spine. The thorax is even, without any prominences; and the elytra or wing cases have each two points at the apex. Individual insects differ considerably in magnitude, from four and a half to six-tenths of an inch in length. Their form is slender; the largest is only 12-100 of an inch in breadth at the base of the elytra. It may be called stenocorus (putator) obscure-brunneus, albido-pilosus; thorace inermi; elytris bidentatis; antennis longitudine corporis, acticulis 2do and 3tio spinula terminatis.

This insect is probably diffused over a large portion of the United States, perhaps from Maine to Georgia, wherever the oaks which it prefers are found.

As the leaves are in full vigour in July, preparing the descending sap, and as the greatest part of the new wood is formed after the summer solstice, the loss of leaves at this season must diminish the tree's increase in diameter in proportion to the quantity of leaves taken from it. But the falling of the branches with the larva in them enables us, though we cannot destroy the species, to check its ravages in some degree. The branches should be collected from the time they begin till they cease to fall, and carefully burnt.

The parts of the mouth which from the feeding apparatus are shewn at figure 1, where (*a*) represents the upper lip, a kind of scale which covers the mandibles on the upper side; this is slightly notched, dotted, and fringed with hairs. (*b*) Shews the form of the mandibles, the inner edge curved, without notches, having a little within the edge a curved line set with short, strong bristles. (*c*) The maxillæ, divided at the outer end, the exterior division the largest, thin and covered and fringed with hairs; the interior smaller, stronger, and terminated with thick set,

curved bristles, forming a stiff brush at the base of the outer division of the maxillary palpi of four joints, the terminal joint largest, obliquely truncated and compressed. (*d*) The lower lip, deeply divided into two parts, thin, rounded at the ends, covered and fringed with hairs; at the base of these divisions are the two labial palpi of three joints, the terminal one of the same shape as in the other pair, but smaller. Figure 2, one of the antennæ magnified, to shew the 2d and 3d joints ending in a small spine. Figure 3, the oak-pruner nearly of the natural size. Figure 4, an end of one of the elytra, magnified, to shew the two points at the apex.

The plum-trees, prunus domestica, have for a number of years been disfigured with irregular swellings on the younger branches. The seat of this disease is in the bark. The sap is diverted from its regular course, and is absorbed entirely by the bark which is very much increased in thickness, the cuticle bursts, the swelling becomes irregular, and is formed into black lamps, with a cracked, uneven, granulated surface. The wood, besides being deprived of its nutriment, is very much compressed, and the branch above the tumour perishes. The cherry tree is affected in a similar manner.

When the Board of Trustees met at the seat of John Lowell, Esq. in Roxbury, on the 27th of June last, Mr. Pomroy took from a cherry-tree in Mr. Lowell's garden, a small branch diseased as above mentioned of the plum-tree. On taking off a thin slice of the tumour, I found it was inhabited by living larvæ; and flattered myself that the disease of both trees arose from the same insect. I brought the branch home with me, and placed it in a large glass phial. On the 6th of July I perceived that the larvæ had left the tumour, and were uneasy in the bottom of the phial. A vessel of earth was immediately prepared, as mentioned above in the account of the pruner; the larvæ when turned into it buried themselves instantly. On the

30th of the same month, or twenty-four days from their leaving the bark, the perfect insects began to rise. They proved to be insects which I had long known to occasion the fall of peaches, apricots, and plums, by the larva eating into the kernel of those fruits long before they had acquired half their growth.

This insect belongs to the same genus with the rhynchænus strobi or white pine weevil, described in the Massachusetts Agricultural Journal for January 1817, to a plate in which I would refer for a representation of the parts of the mouth. In that, the rostrum or snout is nearly strait; in the present species it is curved, so as to form the segment of a circle. All the thighs have two small obtuse points on the under side. In colour it is variegated with white and red hairs; the ground colour of the shelly coat on which they are placed is dark brown. The thorax is contracted behind the head; its surface is irregular, much pitted, and has a raised longitudinal line in the middle, with three small tubercles on each side of it, placed in a triangular form. The elytra are marked with longitudinal ridges, and on these are placed oblong tubercles, of which there are ten or twelve; four of these in the middle of the elytra are largest, smooth, and of a brown black colour. On the under side the body is pitted, or marked, with large impressed points, like the top of a thimble. The first pair of feet is rather the largest; the second the smallest, and all sprinkled with white and bright rust-coloured hairs. The points of the claws on all the feet are double. Figure 5, shews the natural size of the insect, and figure 6 magnified.

Mr. Pomroy was so obliging as to bring me three tumours cut from his plum-trees, later in the season, but the larvæ had left them. Being, therefore, uncertain whether the disease of the plum-tree is to be attributed to this insect or to another species of the same genus, I would call it the cherry weevil. It may be distinguished by the specific name of rhynchænus (cerasi) femoribus dentatis; fulvo

alboque variegatus, elytris tuberculis pluribus carinatis, quatuor in medio majoribus nigris.

Among the 272 species of this genus, mentioned by Fabricius, there were several found in Cayenne and Carolina, which are nearly allied to this; but it differs from them all, and appears to be undescribed.

The evil produced by this insect cannot be wholly remedied; but something may be done to diminish the mischief by cutting off the diseased branches. This however must be done at the right season, and must be the joint care of a whole neighbourhood at the same time. Those which furnished the data above set down, ceased to feed on the 6th of July, rose from the earth on the 30th, and were soon ready to deposite their eggs in healthy branches; but if the diseased branches be cut off in the last half of June, a great number may be destroyed, and most effectually, by burning the amputated parts. It is possible, that in some situations they may be disclosed earlier; it will therefore be surest to prune away the diseased parts as soon as they appear, cleansing the trees *now* of the old tumours, that new ones may be more readily perceived.

W. D. PECK.

Cambridge, Jan. 30, 1819.

Surry, Hancock County, Maine, Nov. 1st. 1818.

DEAR SIR,

In compliance with your request, I now do myself the pleasure to communicate to you the result of an experiment of the effect of Plaster of Paris on the sea board. That you might more fully appreciate the advantage derived from the application of the Plaster, I shall give a short account of the ground on which it was sowed. In the spring of 1809 we broke up and planted with potatoes the

ground in question, which had been cleared of the first growth of timber about forty years since. It had grown up to white birches as large as a man's leg, when cut in 1802. The soil a clayey loam, from ten to twelve inches deep. the substratum a hard clay pan. The next year the same piece was laid down with wheat and herd's grass. We were induced to sow herd's grass, without clover from having observed that the clover rarely lasted more than one year, and was, as we supposed from the great luxuriance of its growth the first year, of disadvantage to the herd's grass the permanent grass. The event, however, did not justify our theory. The herd's grass not swarding the ground the first year it was overrun by a small green moss which often infests our mowing in this vicinity. Instead of cutting from two to three tons of hay to the acre, our usual crop the first year after laying down, when sowed with a mixture of clover, we cut only about a ton, and since then the crop has varied according to the season, from ten hundred to a ton, to the acre. The sixth of July 1817, I sowed a breadth a rod wide through this field with Plaster of Paris, at the rate of between four and five bushels to the acre. The field was mowed about the middle of August. The effect of the Plaster was then visible; the moss being nearly eradicated and the bottom covered with a fine mat of clover. This breadth continued to be distinguished during the fall and until the ground was covered with snow, by the superiority of its verdure. In consequence of this experiment we were induced to sow all our mowing with Plaster, part last fall and part this spring, excepting a breadth of equal width adjoining that sowed last year, which was reserved the better to note the difference. These two breadths were mowed about the middle of July, and the hay cut on a space of fourteen rods in length kept by itself. The result was four hundred of hay of a superior quality on the plastered, or at the rate of over two tons and one quarter to the acre, and but half that

quantity on the unplastered. To this experiment which establishes the comparative benefit of Plaster, not to be attributed to the fine season, I can also add, that on a piece sowed last year with wheat without manuring, and at the same time laid down with herd's-grass and clover, plastered this spring at the rate of three bushels to the acre. We have cut at two mowings over four tons to the acre, the clover being two feet high, and in blossom six weeks after the first mowing.

We have also sowed it to equal advantage on our pasture ground. I observed in the fifth vol. p. 64 of the Agricultural Repository, an account of an experiment made by you, relative to the cutting of potatoes for seed. The following is the result of a similar experiment made by us, which, as it is confirmatory of yours, I conceive almost conclusive.

84 hills planted each with one potatoe cut into three pieces, five and a half bushels.

84 hills planted each with one whole potatoe six bushels.

84 hills planted each with two whole potatoes, seven bushels.

The treatment in every other respect was exactly the same.

With great respect,

Your obd't servant,

CHARLES JARVIS.

Josiah Quincy, Esq.

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ONE of the most successful experiments in agriculture that we have ever known, is that of the Almshouse farm in Salem, which is under the superintendence of Mr. Paul Upton.

This farm consists of about thirty-five acres, as we are informed, and was two years since in a state of nature, and very rough land. It has been brought to, and the produce during the year 1818 was as follows:—

Pork killed, weight 7960 lbs.

Twelve live pigs sold for forty-two dollars.

On hand fifty-seven live pigs.

Corn 400 bushels.

Potatoes 2250 bushels.

Turnips 900 bushels.

Three tons of squashes.

Fifty tons pumpkins.

All the common summer vegetables for the Almshouse. We doubt whether any farm in the United States has produced more in proportion to its size, and it is a proof what well-directed industry can effect.

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